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The Hub



TRADE NEWS PUBLISHING COMPANY
24-26 MURRAY ST. NEW YORK



JOHN W. MASURY & SON

Originators of

Superfine Coach and Automobile Colors

ACKNOWLEDGED THE STANDARD FOR FIFTY YEARS

And Manufacturers of

Fine Carriage and Automobile Varnishes

New York

Chicago

Minneapolis

Kansas City

SHELDON AXLES AND SPRINGS

**For Horse-Drawn and Power-Propelled
Vehicles of All Kinds**

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When you specify "*Sheldon*" you are not experimenting with experiments, but are getting Axles and Springs with years of manufacturing experience back of them—Axles and Springs that are selected for important work where conditions make reliability supremely important

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LARGEST AXLE AND SPRING FACTORY IN THE WORLD

SHERWIN-WILLIAMS VEHICLE FINISHES

A PRODUCT FOR EVERY PURPOSE, PRODUCING DISTINCTIVE RESULTS

S-W METAL PRIMERS S-W BODY AND GEAR UNDERCOATINGS

S-W Q. D. COLORS S-W COLOR VARNISHES

S-W FINISHING VARNISHES

EFFICIENT IN QUALITY AND UNIFORMITY

THE SHERWIN-WILLIAMS CO.

CLEVELAND

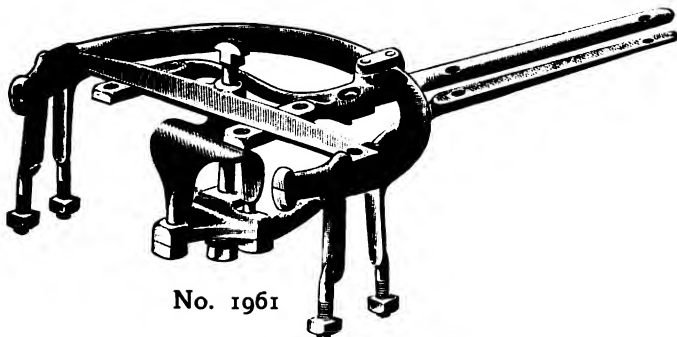
CHICAGO

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MONTREAL

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Carriage Hardware and Gear Irons

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COLOR GRINDERS

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CARRIAGE, AUTOMOBILE AND CAR

PAINTS

COLORS, VARNISHES, ETC.

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The WEST Hydraulic Tire Setter WILL CUT DOWN EXPENSE



Tires set cold in one minute. This machine saves time—does the work better and quicker, does away with burned streaks. Only necessary to measure one wheel in a lot. Does not char the rim, and thus make the tire loosen prematurely.

Saves resandpapering of wheels. This machine is now increasing the profits of many manufacturers. Send for catalog and read about it.

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Established 1886

Correspondence School of Carriage and Motor Carriage Drafting

A thorough, practical tuition is given through this correspondence school. The theory and practice of construction, bookkeeping, perspective. Many men now hold good positions through taking the courses of instruction.

Principal, **THOS. MATTISON,**
Hillside Avenue, Bitterne Park,
Southampton, England

Author of "The Coach Body Makers' Guide," \$3.00; a practical treatise on "The Suspension of Carriages," "Bookkeeping," and other carriage building works.

WHAT IT IS

The American Harness and Saddlery Directory The 1914 Edition

An extra painstaking revision of the names (and other information as below) constituting the Retail Harness Trade, has been completed for this year's issue of the Directory, and we think the work is so important and worthy that the

1914 Price Is \$5 Per Copy

and it is very moderate for what is offered in a work that is

Indispensable for Reference

for copying of addresses, and for all purposes usual in a directory.

Just a Sketch of Its Contents

The list of the **WHOLESALE and JOBBING TRADE** is so arranged as to make it convenient to separate the association members from those not so recognized.

The **RETAIL HARNESS MAKERS** of the United States and Canada comprise the principal part of the Directory, arranged by State, Town and County, and in the large cities, the street and number is given. Those rating (approximately) over \$1,000 are marked.

A list of **HARNESS DEALERS** as distinguished from retail harness manufacturers, is also given. The value of this list to those who solicit the vehicle, implement, hardware and department stores will be readily appreciated.

A list is also published of Export Commission Merchants, giving the class of merchandise they handle.

PUBLISHED BY

THE TRADE NEWS PUBLISHING COMPANY

PUBLISHERS OF "HARNESS"

24-26 MURRAY ST., NEW YORK

PORTER'S BOLT CLIPPERS

"Easy" "New Easy" Allen-Randall



To Cut 5-16, 3-8, 1-2, 5-8, 3-4 inch.

H. K. PORTER,

EVERETT, MASS.

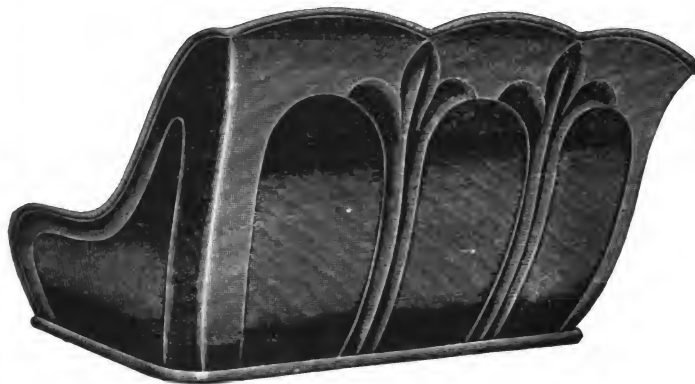
THE F. H. LAWSON CO.

CINCINNATI, O.

Manufacturers of

Metal Buggy Seats

FLEUR DE LIS PATTERN

**NEW STYLES—ALL SIZES****STRONGEST—NEATEST—BEST**

No Solder Used

YOUR VEHICLE SELLS WHEN EQUIPPED WITH

LAWSON'S METAL SEATS

Write for Prices

CARRIAGE—WAGON—AUTOMOBILE
AND SPECIAL
DROP FORGINGS
QUALITY—THE
BEST

Richard Eccles Co., Auburn, N. Y.

PROMPT
SERVICE.
WRITE FOR CATALOG.
SEND BLUE-PRINTS OR MODELS
FOR OUR QUOTATIONS—IT WILL PAY YOU

THE FAIRFIELD RUBBER COMPANY

Manufacturers of

**Carriage Cloth, Imitation Leather,
Automobile Cloths, etc.**

FAIRFIELD,**CONNECTICUT****Cargill Service**

has brought to the Cargill
Company more Vehicle
Catalogues than are made
by any other printing
house in America.

Cargill Quality
is bringing The Best Auto-
mobile Catalogues to our plant for
Complete production—watch
for our imprint in the Season's
best books.

THE CARGILL COMPANYDESIGNERS
ENGRAVERSPRINTERS
& BINDERS

Grand Rapids, Michigan

Carriage MechanicsDesiring to improve their present
Condition should attend the**TECHNICAL SCHOOL**

FOR

Carriage Draftsmen and Mechanics

SUPPORTED BY THE

Carriage Builders' National Ass'n

The object of the School is to teach men to design
vehicles and make working drawings, and to otherwise
facilitate their work in the shop. Only those men em-
ployed in carriage or automobile building or their acces-
sory trades are admitted to its privileges.

The classes are conducted in three divisions, viz.: Cor-
responding, Day, and Evening. The former is open during
the entire year, while the day and evening classes are in
session only from October 1 to April 1.

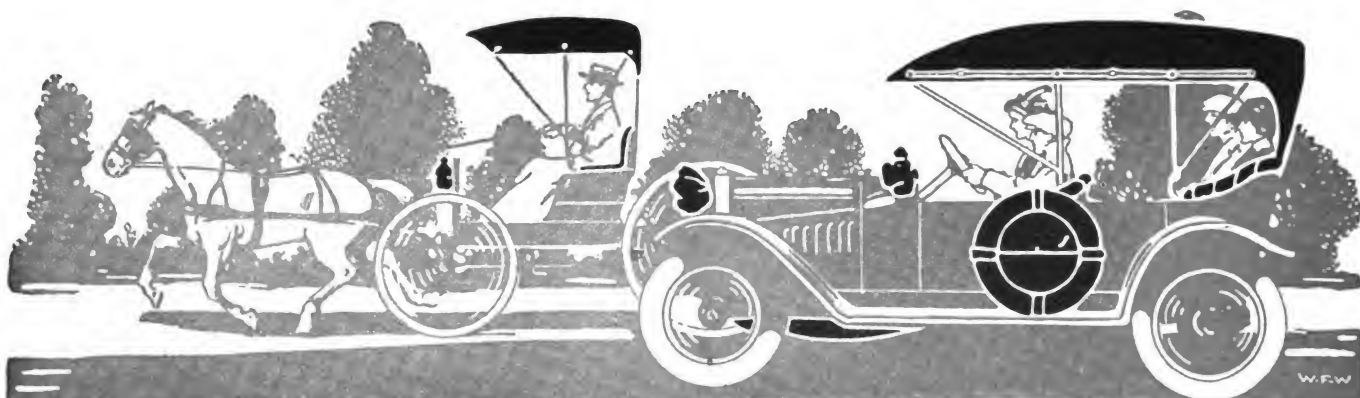
The tuition is moderate.

For prospectus and full particulars, write to the instructor,

ANDREW F. JOHNSON,

20 West Forty-fourth St.,

NEW YORK CITY



Learn More About The Leading Leather Substitute

Every carriage and automobile manufacturer—every manufacturer of carriage and auto accessories, storm curtains, aprons, lamp covers, tire cases, trunks, etc., should get and examine samples of

MERITAS

LEATHER CLOTH

Only by seeing the goods—by testing them—by noting the handsome, durable, non-cracking finish and the fine line of colors can you appreciate the high quality we have attained in the manufacture of a serviceable leather substitute.

There are styles, colors and finishes in MERITAS LEATHER CLOTH suitable for every carriage and auto trimming and upholstery purpose.

It can be had in muslin, duck and drill; dull or glazed; smooth or grained; in black and colors.

Sample book on request—write now and know more about the leading leather substitute.

Write
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sample
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MERITAS
LEATHER CLOTH
NOW

The Standard Oil Cloth Co., Inc.

320 Broadway, New York

The Hub

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Vol. LVII

APRIL, 1915

No. 1

THE TRADE NEWS PUBLISHING CO. OF N. Y. Publishers of THE HUB

J. H. WRIGHT, President

G. A. TANNER, Secretary and Treasurer

24-26 MURRAY STREET, NEW YORK

Other Publications of Trade News Publishing Co.:

HARNESS (monthly).....per year, \$1.00

AMERICAN HARNESS AND SADDLERY

DIRECTORY (annual).....per copy, \$5.00

THE HUB is published monthly in the interest of employers and workmen connected with the manufacture of Carriages, Wagons, Sleighs, Automobiles and the Accessory trades, and also in the interest of Dealers.

Subscription price for the United States, Mexico, Cuba, Porto Rico, Guam the Philippines, and the Hawaiian Islands, \$2.00, Canada, \$2.50, payable strictly in advance. Single copies, 25 cents. Remittances at risk of subscriber, unless by registered letter, or by draft, check, express or post-office order, payable to the order of THE TRADE NEWS PUBLISHING CO.

For advertising rates, apply to the Publishers. Advertisements must be acceptable in every respect. Copy for new advertisements must be received by the 25th of the preceding month, and requests to alter or discontinue advertisements must be received before the 12th day of the preceding month to insure attention in the following number. All communications must be accompanied by the full name and address of writer.

FOREIGN REPRESENTATIVES:

FRANCE—L. Dupont, publisher of *Le Guide des Carrossiers*, 78 Rue Boissiere, Paris. Subscription price, 15 francs, postpaid.

GERMANY—Gustave Miesen, Bohn & Rh. Subscription price, 12 marks, postpaid.

ENGLAND—Thomas Mattison, "Floriana," Hillside avenue, Bitterne Park Southampton. Subscription price, 12 shillings, postpaid.

Entered in the New York Post Office as Second-class Matter

Moving to Larger Quarters

The office of the Trade News Publishing Co. (publishers of The Hub), which for the past fifteen years has been located at 24-26 Murray street, is being moved to the Edison building, corner of Elm and Duane streets, New York, where a handsome suite of offices have been secured on the sixth floor.

In our new quarters we will have many times the space formerly occupied, and will be better equipped than ever before to look after the interests of readers and advertisers.

We extend a cordial invitation to our numerous advertisers, subscribers and others in the trade to call and get acquainted with us while in New York. We will try to make you feel "at home." You can write your letters, receive mail, telephone calls, etc., in fact make your headquarters with us while in the city.

Our new offices are conveniently located and can be easily and conveniently reached from any part of the city. The Edison building is of modern fireproof con-

struction throughout, and one of the best known buildings in New York. It is located two blocks north of the City Hall and one block east of Broadway.

Jitney Legislation

Far, fast and wide are the travels of the jitney bus. Likewise the opposition to their continued development, as means for transportation in competition with street railways. Different legislatures have taken up the matter of jitney regulation and in some sections the measures proposed have met with overwhelming defeat. In others they have received general endorsement, qualified, however, by amendments calculated to nullify their more stringent requirements.

Legislators have now on their hands a proposition that is food for thought and ponderment. How best to satisfy the indignant and all-powerful traction corporations, and at the same time evolve a method of regulation that will not prove too heavy a hand on the future transportation development, is a problem that will require careful analysis in almost every state, more especially in the large cities.

Nearly all bills so far introduced in various states have either met with defeat or have been amended in the way that takes out the "sting," or else have openly favored the jitney. In a few instances, however, the situation has been handled in a way eminently satisfactory to all interests.

Much may be done both for and against the development of the new form of urban transportation and it will be of increasing interest to note the attitude of various governing bodies in this connection, for it seems assured the jitneys have come to stay.

Safeguarding Employees

The United States Steel Corporation figures that it has saved \$2,771,980.35 net in the last five years by safeguarding its employees.

Manager Close, of the company's Bureau of Safety, Sanitation and Welfare, reports that while the company has spent over \$2,000,000 in looking after its workers, casualty expenses have been reduced by much more than double that sum.

Since machinery was introduced modern industrial progress points to no more significant landmark than its organized efforts to protect workers from accident and from low standards of living. There is now hardly a large corporation in the country which does not rec-

ognize the principle and to greater or less degree apply it.

Welfare of employees is no humanitarian hobby. It is sound business which, as the steel company's figures attest, can be put into impressive terms of dollars and cents.

BUSINESS AFTER THE WAR

Much useless and foolish prophecy is being uttered and printed regarding business conditions throughout the world after the end of the prevailing war in Europe. For light on this question, says Hide and Leather, let us look backwards.

Theodore H. Price, in the *World's Work* for March, states that our own Civil War gave a striking example of prosperity in war times and immediately thereafter. The Boer war was followed by the greatest trade expansion England has ever known, and the decade following the Spanish-American war showed a business expansion in the United States that was almost miraculous in suddenness and volume. The Crimean and the Franco-Prussian wars were almost similarly concurrent with increased business activity.

Secretary Chase, in December, 1861, called attention to the "considerable improvement in trade and industry," and this movement continued to grow and was not exhausted until the panic of 1873, eight years after Appomattox and ten years after Gettysburg.

Mr. Price argues that if our country continued prosperous until 1873, after one of the most terrible wars in history, there would appear to be but little reason to anticipate a depression in the United States in consequence of the struggle from which we are separated by a vast area of ocean and which enormously increases the demand for our chief agricultural food products.

It is considered possible that our active foreign trade may result in merchandise balance in favor of our country of a billion dollars for the year 1915. This would be about \$400,000,000 in excess of any record previously established.

Aside from men killed or disabled, the economic waste of war is not as great as generally imagined, and it is possible that the economies which the non-combatants practice in time of war may in a large measure offset the destruction of property by military operations.

Mr. Price estimated the cost of the war for six months at six billion dollars. The population of Europe is 450,000,000. It is possible that the average expenditure for unnecessary and unproductive things has been reduced \$15 per capita. The costs of the war may, therefore, be met by saving. In America the great majority of people have probably cut their expenditures much more than \$15 per capita during the past six months, while in Europe the incentive to economy has been far greater than in the United States.

Our own Federal Reserve Act has restricted the use of gold. The reduction in the reserve from 25 to 18 per cent. and the provision for the issuance of federal reserve notes, will make possible an enormous expansion in the volume of available credit.

All in all, Mr. Price does not look for any depression in business after the close of the war, and this should be stimulating and encouraging for those who are inclined to be pessimistic.

TO REGULATE SALE PRICE OF REPAIR PARTS IN OKLAHOMA

E. W. McCullough, general manager of the National Implement and Vehicle Association, has made the following pertinent comment on the bill now in the Oklahoma legislature, which is designed to regulate the prices charged for repair parts for vehicles, implements and farm machinery sold in that state. He says:

It will be evident to any one understanding the situation relative to repair parts for this class of merchandise, that the

person who framed this bill certainly was not in touch either with the manufacturing and distribution of repairs or the handling of them by the retail dealer.

Certain it is, however, that if such a law was passed, repair stocks which have been carried at convenient points in that state for the convenience of the farmer in order to render him prompt and efficient service, would in all probability be withdrawn, so that his source of supply would be without that state and under Federal laws governing interstate commerce. The conditions imposed by the law are impossible, and it is hoped that if the legislature of that state gives the bill any consideration it will be to order it into committee and instruct that an investigation be made.

A similar bill was suggested last July, but after we had correspondence with the Corporation Commissioner of that state and received the assurance that if such a law was proposed, our people would be given an opportunity to be heard, nothing farther came of it.

We are sending you this largely as a matter of information, as both the manufacturers and the dealers must be constantly on their guard during this time when the legislative mills are in active operation, for no matter how impossible some of these proposed bills may seem they are likely to be enacted into law unless given attention.

The bulletin referred to by Mr. McCullough is as follows:

Repair Parts Legislation Oklahoma Bill

The following is a copy of House Bill No. 613 recently introduced in the Legislature of Oklahoma, and is self-explanatory:

State of Oklahoma "Regular Session of 1915" "An Act"

Making it a misdemeanor for any person, firm or corporation to sell separate parts of plows, binders, mowers, rakes, buggies and automobiles, or any other farm machinery or vehicle for more than twenty (20 per cent.) above the actual price charged for such parts as sold in the complete machine or vehicle, and declaring an emergency.

Be it enacted by the People of the State of Oklahoma:

Section 1. Any person, firm or corporation who shall sell separate parts of plows, binders, mowers, rakes, buggies and automobiles, or any other farm machinery or vehicles for more than twenty per cent. above the actual price charged for such parts as sold in the complete machine or vehicle, shall be deemed guilty of a misdemeanor and upon conviction thereof, shall be fined not less than Five Dollars, nor more than Fifty Dollars for each and every offense.

Section 2. An emergency is hereby declared to exist by reason whereof it is necessary for the preservation of the public health and safety that this act take effect and be in force from and after its passage and approval.

This bill comes rather as a surprise, for we had considerable correspondence with the Corporation Commissioner of that state last year regarding the bill he was reported as preparing, and the outcome was a letter from him expressing appreciation of the information we had given him and stating that if such a bill was proposed we would be given an opportunity of being heard, we inferred, before it was introduced.

However, this bill has been presented, and we have taken the matter up with the secretary of the Dealers' Federation, also with the officers of the Oklahoma Dealers' Association, and would suggest that you communicate with your representatives in that territory, and also with your individual customers, for the passage of such a bill would be obviously detrimental to the interests of the manufacturer, dealer and farmer.

We trust that those interested in that state will not fail to give the matter immediate and careful attention.

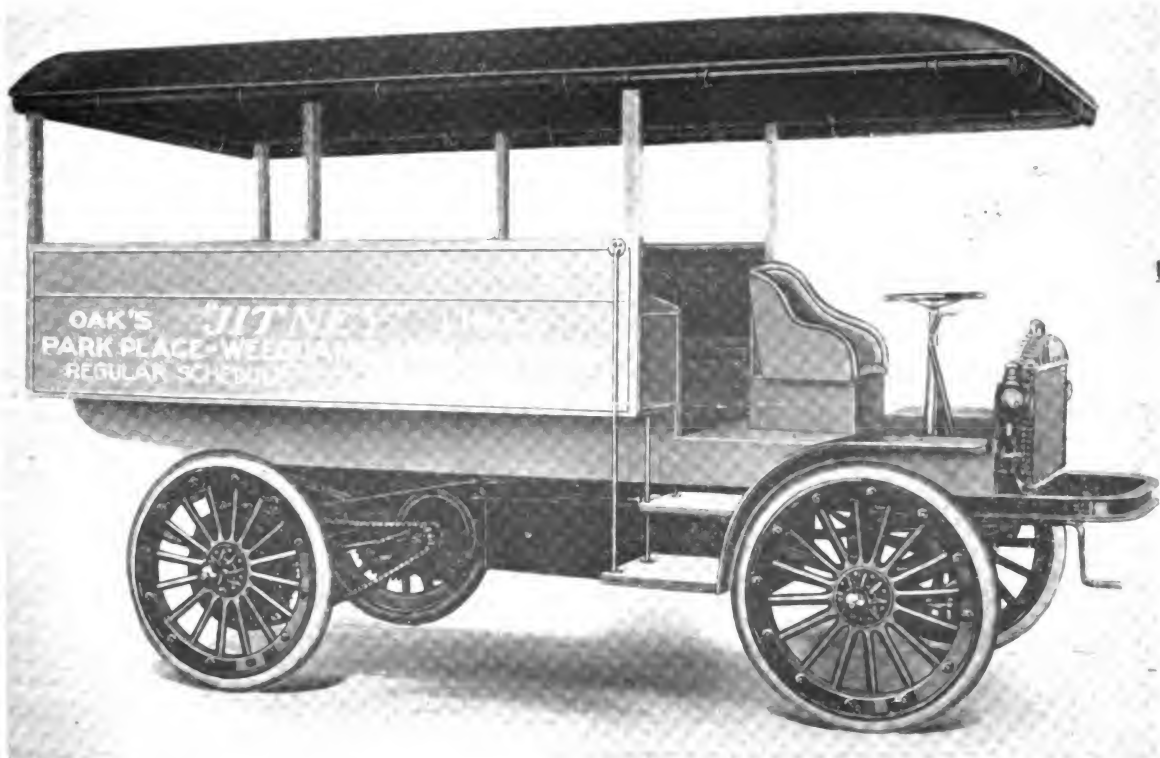
KANSAS CITY CONVENTION DATES

At a meeting of the board of directors of the Western Retail Implement, Vehicle and Hardware Association, March 16, it was decided to hold the next convention at Kansas City, on next January 11, 12 and 13.

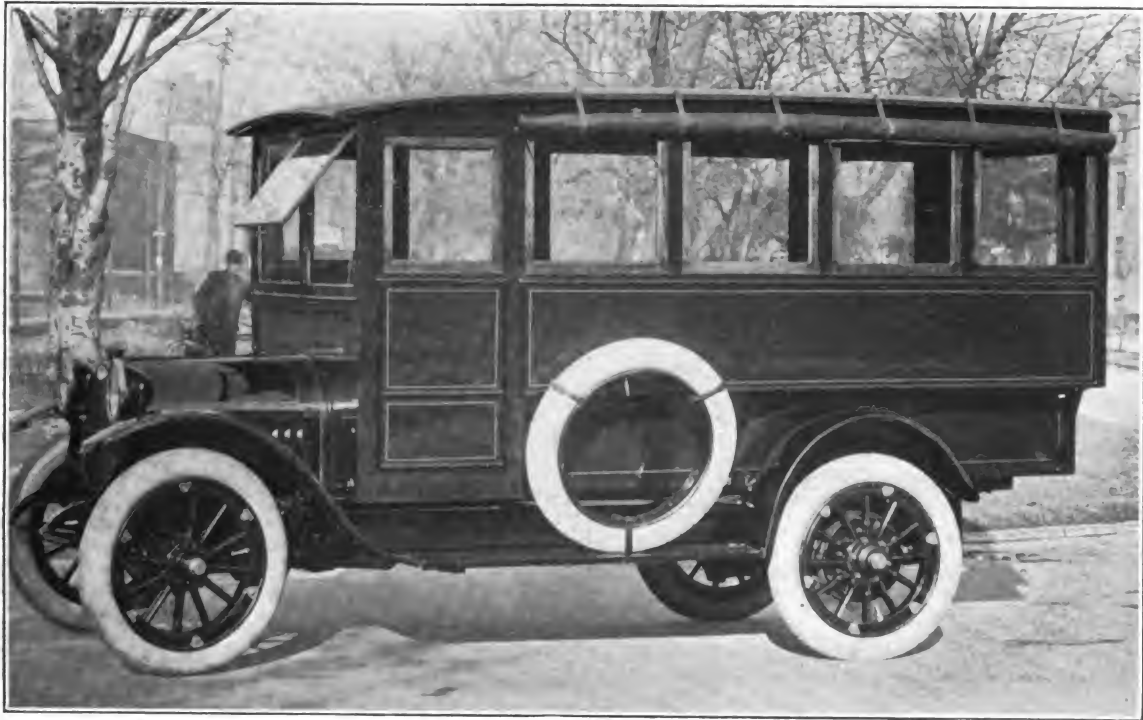
JITNEY BUSES



KISSEL CAR 3 1/2 TON JITNEY, COMPTON, CAL.



KOEHLER CO.'S KOEHLER ONE TON TRUCK JITNEY,
NEWARK, N. J.



STUDEBAKER PAY-ENTER JITNEY BUS



Entrance of Studebaker Jitney Bus, showing
fare box, steering wheel and control



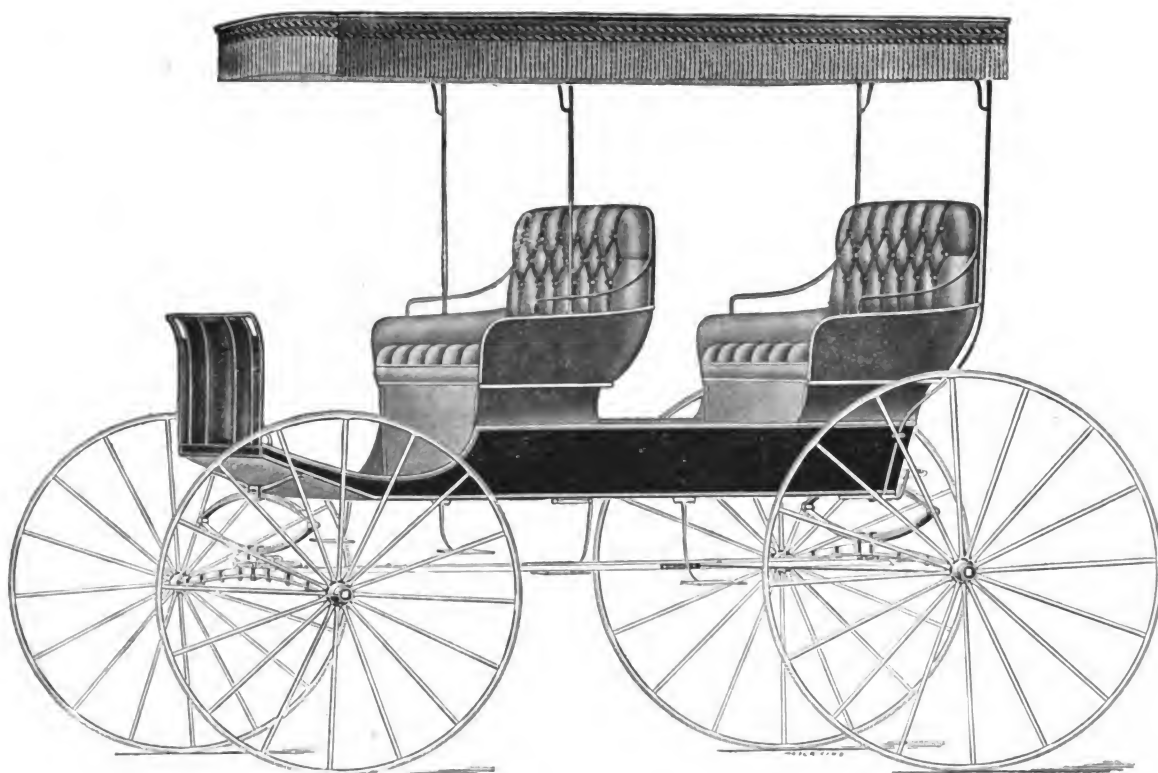
Interior of Studebaker Jitney, showing
driver's seat and entry way



No. 21 TOP BUGGY
Made by Lull Carriage Co., Kalamazoo, Mich.



No. 38 MOUNTAIN CONCORD BUGGY
Made by Lull Carriage Co., Kalamazoo, Mich.



CANOPY TOP FARMERS' SURREY
Made by Parry Manufacturing Co., Indianapolis, Ind.



NEW MODEL, HIGH GRADE PHAETON
Made by Parry Manufacturing Co., Indianapolis, Ind.

PAY AS YOU ENTER JITNEY BUS

The accompanying illustrations show a new style of jitney bus now in operation at Toledo, O. Mr. A. C. Bally, who is the designer and builder of this bus, is also connected with the operation of same. He sends us the following interesting information regarding the bus:

The body is essentially a steel structure. The ribs, which run entirely around, are of channel iron. The lower part is



Interior of A. C. Bally Pay-Enter Jitney

enveloped in steel. The top is made of canvas. The bus is equipped with electric lights, push buttons and good spring cushioned longitudinal seats, and rides as smoothly as any touring car.

We claim to have in this designed body a happy medium between the small unprofitable five-passenger, and the large cumbersome and expensive forty-passenger car. We carry a maximum load of 25. The comfortable seating capacity is 20. The operation of this bus has proved a success, insofar as it especially serves women and children. It is not our aim to put the street railways out of business, but to give service

where they do not, or cannot. The route we follow does not parallel the street car lines excepting for several blocks at either end. We will put more cars in service, and will have at least one in reserve in case of emergency and for rush hours.

The results of two weeks' service have been such that we are convinced, that with proper, systematic service, this jitney bus will be a winner. The revenue from evening parties, Sunday picnics and the advertising scheme in the car, will be no small item.

Mr. Bally states that in his opinion to successfully operate a jitney bus the following will be required: The best chassis obtainable; a properly constructed body; careful operators; a good route; reserve cars for emergency; a regular schedule; proper management. With all these combined the jitney bus service will be a success.

THE AUTOMOBILE INDUSTRY IN GERMANY

A recent bulletin from the American Association of Commerce and Trade, Berlin, Germany, conveys the interesting information that since the automobile is occupying now a very important position in modern warfare, it is apparent that Germany's automobile industry is now working overtime.

Automobilists the world over have recognized the German automobile builder, who preeminently is a builder of individual cars, as one among the leaders in the scientific development of automobile engines as well as body and chassis design. It is expected that during the entire war German car builders will continue to be extremely busy and will also be able to prepare themselves for the demand which is bound to result from the war.

In considering the possibilities after the war, it is obvious that the cars must be replaced which have been used for military purposes, and this refers also to auto trucks and omnibuses, which all have been requisitioned for military use.

During the present time, omnibus companies and similar organizations cannot replace their cars as the automobile factories are busy filling orders for the army and therefore such cars can only be built after the war.

Omnibus and taxicab companies, breweries and other industries, will place large orders in order to be able to carry on their old time operation.



A. C. BALLY, TOLEDO, PAY-ENTER JITNEY

The same as in America, the automobile is not looked upon any more in Germany as an article of luxury and therefore it can be justly said that the present good condition of the German automobile industry does not indicate a passing rise.

American cars of popular price enjoy a good reputation in Germany, and their use is steadily increasing. It seems that the future belongs to popular priced cars of about \$750, two or five passengers, equipped with accessories and appliances which tend to make auto riding a pastime and healthy exercise.

Contrary to American practice, but few owners drive their own cars, because cranking, change of tire, pumping, etc., constitute the less desirable features of automobilism.

American car builders have long since overcome these drawbacks in turning out automatic appliances which so far have not been introduced to any extent in Germany.

As a matter of fact, few ladies can be found who drive their own automobiles, the reason being that automobile operation still lacks the advantages of the average American car.

German license regulation for car builders are rather strict, as for instance, rack and pinion for the steering gear is not permitted, only worm drive. Cars must be equipped with both foot and hand brake, the foot brake acting upon the driving shaft, and the hand brake upon the rear axle.

There is no doubt that the German line of practical car appliances can be improved, as above mentioned. But also the number of good accessories is still limited.

American manufacturers would do well in paying attention to the hints above given.

A NEW TRADE ASSOCIATION IN ENGLAND

A new association, which is to be called the National Master Wheelwrights', Smiths', Coach and Motor Body Builders' Association, is in process of formation in England. Its objects cover a very wide range of benefits, and it is stated that those responsible for drawing up the scheme have already achieved marked success for the mutual welfare of the master farriers.

Among the objects mentioned are the making of trials or experiments in reference to matters affecting the trades concerned, watching all laws which affect or may affect the trade, and assisting members who may be involved in any legal proceedings of technical interest. The promotion of lectures, purchase of instruments and tools, and the giving of prizes is also mentioned. Undesirable customers are also to be noted, while funds are to be provided for sick, accident, death, and other benefits. Co-operation with existing associations is looked for, regulation and fixing of prices is also foreshadowed, while it would be within the scope of the association to promote any journal dealing with the trade. The objects also include the settlement of trade disputes.

It is proposed to divide the work of the association into branches, each one appointing its own officers and conducting its own business. Where there shall be present at any meeting more than one member of a firm, such firm shall only have the same voting power as a single member.

On all questions affecting disputes with employes, members shall have the following voting power: In cases where less than 20 men are employed, one vote; in case of 20 to 50, two votes; and above that number, three votes. No firm shall have more than three votes.

Members must be at least 21 years of age and carrying on business as a master in the trades concerned. The contributions are based on a scale depending on the number of men employed and the number of benefits desired, among the most important being the scheme whereby contributions to an insurance fund for the insurance of employes under the Employers' Liability Act, 1880, and the Workman's Compensation Act, 1906, have the effect of considerably reducing the payments at present made, especially on behalf of wood-working merchants. There are also many rules governing the election of officers, committees, the general conduct of branches, and so on, the impression given being that the scheme is, on the whole,

framed to give the same advantages to masters as already exist for the workman by similar means.

This association should be worthy of the attention of those members of the Institute who wish to co-operate on matters which many think cannot be fittingly included in the activities of that body, while it should do much to strengthen the hands of the few local associations already in existence, which need some scheme of federation if the trade as a whole is to be really benefited.

INTEREST IN TRUCK DRIVERS

Kansas City House Makes Them Partners in Business

Although most intelligent truck owners have come to realize that the one biggest factor in truck efficiency and economy is the driver, few have evolved methods by which he can be kept at his most efficient point. The McPike Drug Co., of Kansas City, is trying out a new scheme with its motor trucks which ought to interest other truck owners and seems to promise good results. It is co-operative between the truck drivers and the company and was adopted several months ago after careful figuring to obtain greater efficiency.

The driver buys the truck from the company by a series of monthly payments and thereby becomes responsible for the up-keep and maintenance and incidentally assumes all worries. He also looks forward to future profits when he pays out on the truck and to extras that he may pick up in hauling for others.

The driver is started out with a new truck. He is given \$250 a month, which is what a similar truck has been costing the company. Half of this sum, \$125, the driver pays back to the company until the truck is paid for. The remaining \$125 represents his salary of \$60 and \$40 for his helper. The remaining \$25 is for repairs, oil and gasoline.

The benefits are that all troubles are passed on to the driver. He will take especially good care of the truck, for as soon as he has paid out on it he will have a bonus of \$100 a month. That gives him something to work for and prevents careless driving, which reduces the life of a truck. The possible life of the truck is four or five years under proper handling. He will pay out on the truck in less than three years, and the balance of the life of the truck will be velvet for him at the rate of \$100 a month. This plan has during its seven months' trial shown repairs less than \$10 altogether.

When the driver has paid in two-thirds of the price of the truck he is allowed to do extra hauling on his own account with it. Every other morning he is off until 10 a. m. and can use that time on his own work. Sundays he can use the truck for picnic parties.

When the truck is worn out the driver can buy a new one, or if he has not the money the company will trade in the old one on a new truck and sell it to him under the same plan as at first. The price of \$250 a month is just what the company could hire a hauling company to do the work for.

"BANNER" TO BUILD AUTOS

The Banner Buggy Co., of St. Louis, Mo., has let it be understood that it intends to enter the automobile business with a fully-equipped factory employing 600 skilled workmen. It is planned to operate the automobile business as a subsidiary concern under the style Banner Automobile Co. According to present prospects the car will be a medium-powered four-cylinder model selling at less than \$1,000.

A government official stated recently that the American public have been spending on an average about six hundred million dollars annually on European travel. A majority of this money in 1915 will be spent in the United States. Retailers, jobbers and manufacturers should all profit accordingly.

REVOLUTIONARY ELECTRIC AUTO

Charles P. Steinmetz, Famous Consulting Engineer, Prophesies the Usurpation of the Gasoline Car's Throne

Calmly, and with no hint of the excitement that might well have accompanied his words, Dr. Charles P. Steinmetz, the consulting engineer whose name is one to conjure with in the electrical world, predicted to a representative of the New York Times recently what amounts to a revolution in the automobile industry. His theme was the certain coming of the electric motor vehicle into predominance and its usurpation of the throne of the gasoline car for most of the purposes to which the motor vehicle can be put.

The immediate cause of this prophecy was the perfecting of a device for the improvement of electric automobiles quite as revolutionary in its way as the broad prediction itself. This is the entirely novel power plant, forming an integral part of the rear axle upon which Dr. Steinmetz has been at work in his capacity as consulting engineer. In what might be called the office of his fascinating laboratory in Schenectady the wonder-worker, not only in electricity, gave a full account of this device and its incorporation in the electric vehicle, and also lifted the curtain on his conception of the future as far as it applied to vehicular traffic.

The new invention which Dr. Steinmetz feels is to make such important modifications in automobiles, although not of his origination, may be said to have been inspired by him. For it was not until he had declared his faith in the promise of the electric motor car, first at a meeting of the Electric Vehicle Association of America and later in another address before the annual convention of the National Electric Light Association, that the invention was brought to his attention and attained its development. Its importance may be briefly summarized by saying that it will bring down the weight of electric automobiles to one-third of the present figure and reduce their cost at least proportionately, putting this type of car at one stroke out of the realm of the costly luxury and into that of the exceedingly moderate-priced convenience.

Simplification, reduction in the number of parts, and great reduction in weight mark the new device, which is the invention of Harry E. Dey, an electrical engineer of New York. A small syndicate of professional men to carry on the experimental work necessary has been formed, and of this syndicate Dr. Steinmetz is one, while Capt. Max E. Schmidt, of New York, is chairman of the board of governors.

When chairs had been pulled up to the broad desk in the laboratory office, and cigars lighted, Dr. Steinmetz began to describe this forward step in the realm of self-propelled vehicles.

"I have always felt," he said, "that if the electric car could be produced under the same conditions and by the same methods as the gasoline car, it could be put in the category of the popular-priced machine. The trouble with electric car making at present is that it is all piecework. Each car is a little different, each person wants some special detail, and the production is by hundreds rather than by tens and hundreds of thousands. That is all very well for the purpose of special, luxurious, and consequently costly, machine, but it is not the method which has made the low-priced gas car such a wonderful success.

"You know the difficulty with either type of car has been to get not merely a cheap car but a good cheap car. The early gasoline cars were cheap. Prices were about \$1,000 or \$1,200. But they gradually became more expensive as the makers found that the demand was for better vehicles. It was not until the plan of huge production, with a minimum of frills but a maximum of performance in the product, was put into operation that we got what we had been looking for—the good car at a low price.

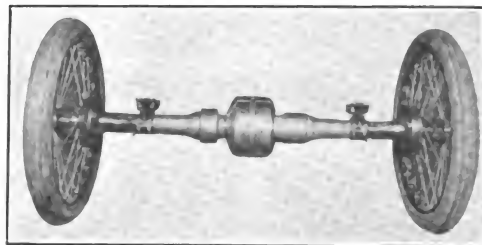
"Many people think that the whole trouble of the electric lies in the storage battery. This is not so. It used to be true.

Batteries would deteriorate with alarming rapidity. But the perfecting of the Edison battery has not only provided a very satisfactory battery in itself but has also led the lead battery makers to improve their product by reason of competition, until the lead battery is also highly satisfactory today.

"The real source of trouble until the time of Mr. Dey's invention, has been complexity of structure, multiplicity of parts, and consequent great weight. Now, by a delightfully simple method, these disadvantages have been done away with and, at the same time, a more efficient power plant has been provided.

"This desirable effect has been brought about by the introduction of a principle new to electric motors; new, at any rate, to motors for vehicles. The motor in this novel rear axle has both field and armature free and revolving. Heretofore one or the other of these constituent parts of the electric motor has always been stationary. But by the simple idea of having them both revolve, see what a host of benefits are brought about.

"In the first place, the field turns one of the vehicle's rear wheels and the armature turns the other; hence the motor acts as its own differential, and this delicate and at the same time heavy part of the ordinary car is banished. Secondly, the motor becomes part of the rear axle instead of being mounted under the car or on some other part of the frame. This does away with another entire unit which must be taken care of, and eliminates, as well, the shafting from the motor to the rear axle, the bevel gearing, and the housings for these parts.



Rear axle of new electric vehicle of one-third the weight and about one-third the cost of the present types. The bump in the center of the axle contains the entire power plant with the exception of the battery and controls, and embodies in one housing, motor, differential, and all the driving parts

"Thirdly, this arrangement leaves the entire underbody of the car free, so that the battery can be put in the most convenient place, and it also ends the necessity for such a rigid structure (which means heavy structure), as will keep everything in place, prevent whipping of the shaft, and keep the bevel gears in mesh. The battery need no longer occupy the space under the seats or a special compartment in the front, and all the space above the level of the frame is left free for other uses.

"In addition to these advantages, this novel motor is more efficient. The idea of having both armature and field revolve doubles the output of power, although it does not double it relatively to the amount of current fed to the motor. But it lends itself to other uses and to a type of control, invented by Mr. Dey, which also marks a big stride forward.

"This new control does two highly desirable things. It greatly lessens the reduction in speed when climbing hills, which has always been a drawback of the electric vehicle, and it turns the motor itself into a brake on the down grade, and even makes it act as a generator when a predetermined speed has been passed and puts current back into the battery!"

A quizzical light came into Dr. Steinmetz's eyes when he saw the bewilderment of his visitor at this last statement. He paused a moment to enjoy the situation. Then he smiled and said:

"This is not a perpetual motion scheme, you know. When the motor is acting as a generator it is not putting in as much current as it took out of the battery when it was climbing the

hill. It is not quite as good as that. But it does give the battery a real help, a 'boost,' as it is called technically, of considerable proportions. For instance, with a car of a certain weight I have found that the motor begins to send back current to the battery when the down grade reaches $2\frac{1}{2}$ per cent. If you are running down the hill at full speed this motor-generator will put back as much current as it takes to run on the level when the grade reaches 5 per cent. If the control is set at half speed it will charge full power likewise on a grade of $7\frac{1}{2}$ per cent.

"The last-named condition would be that most usual under ordinary running, because, unless the hill is long and straight and the road surface good, one does not want to run down it at the rate of, say, 30 miles an hour. The half-speed position will give a rate of 14 or 15 miles an hour. When that speed has been passed the motor will begin to charge the battery and also to act as a brake. This is a most important feature, for it means that nearly all hills can be negotiated without the use of the ordinary brakes and with none of the discomfort or bother incident to their use.

"This will be a feature of value not only to the user of the electric pleasure car, but also to the owner of the light delivery wagon or the heavy truck, because it is a safety feature and makes the electric still more 'fool proof' in the hands of the unskilled or, at least, not mechanically educated driver.

"When it comes to the question of driving radius on a single charge of the battery I do not believe that the new motor and control will have a great deal of bearing, although undoubtedly there will be some increase because of the much lighter weight of the vehicle—we hope to get it under 1,000 pounds—and the consequent smaller consumption of power. But this matter of long distance on a single charge is not a vital one after all. The average automobile is not used for touring. I do not believe the average daily mileage of most cars is above say, 30 miles a day. This distance is, of course, far within the limitations of the present battery.

"For those who may wish to go touring in their electrics it will be an easy matter, especially in view of the liberation of space in and under the car by the use of this new power plant, to take an extra or additional battery along. I think the time is at hand when such a battery need not even be purchased, but can simply be rented for the time that it is wanted.

"Moreover, there is a constant improvement in the facilities for recharging batteries. The central stations which supply light and power are awakening to the possibilities of this part of the business. I look for a far wider development still of this matter. You see, the business of 'boosting' electric vehicles fits in well with the other activities of the central station. Most of the recharging is done at night when the load at the plant is light. This means that by taking on this work in addition to its regular duties the central station will show more efficient operation. There will be no fixed charges, for the plant will be using its produced output of power in the most economical way.

"For this reason I look for the time when the central stations will provide both charging and storage. They can do it best, and it should be very cheap for the owner of the vehicle. It does not seem to me at all out of the bounds of the probabilities that the owner of an electric will be able soon to drive his car to the central station at night, have it stored there and charged during the night and take it out again, ready for the day's work the next morning; all for the modest sum of, say, \$10 a month, with a possible small additional charge for washing the car.

"Certainly the central stations should be alive to this opportunity of increasing the recharging work with vehicles. If they are not they will find keen competition from the garages. It is an easy matter for a garage to introduce an isolated charging plant. Garage men are competent to run such an isolated plant; that is to say, the average garage man is competent to do so, because there is nothing really to such a plant which requires expert attention save the gasoline or crude oil

engine, and with that the operator of a garage is supposed to be familiar. The generator will practically run itself."

"How about the isolated plant in connection with the private house?" Dr. Steinmetz was asked.

"That also is not a difficult matter mechanically," was the reply; "the trouble has been in getting some one to operate the plant properly and continuously. Beyond the cost of installation such an outfit is not much of an expense. But, of course, the best place of all is the central station and the next best the garage. That is when generating plants are in question. When you come to the matter of a charging station in a private house when the current is drawn from the regular source of supply—the lighting current, for instance—that is another question.

"Usually, it is very reasonable to charge an electric vehicle in this manner. Take, for example, an average city where the charge for lighting current is 10 cents a kilowatt hour. Now, the average car, I believe is not run more than 30 miles a day, which means the consumption of about three kilowatt hours of current, or a charging cost of 30 cents a day. I think 20 miles of running, or 20 cents a day, would be really nearer the mark. And this, be it remembered, is at lighting rates. For cities or towns where the current is of the alternating type the installation of a transformer is required; for cities like New York, where the current is direct, even this is not necessary."

It was evident from the confidence with which he spoke of these possibilities that Dr. Steinmetz looked for the day when the electric car should be well nigh as ubiquitous as the telephone.

"The new type of power plant," said Dr. Steinmetz, "is applicable to any kind of a vehicle. We think well of it for commercial vehicles, for instance, because, for one reason, it will leave the entire body space of the car free for the carrying of goods. There are many minor uses also to which it could be put. There are now motor lawn mowers, for instance. There is no reason why this invention should not prove the superiority of the electric in this field. A lawn mower equipped with it could be run very economically with a small storage battery. The mileage of a lawn mower is not so great, you know.

"Then there is another application of the device—not a minor one this time—which has seemed to me quite practical. I mean its use as a gasoline-electric outfit. To understand the advantages in this sphere one must understand something of the limitations of the present gasoline engine. The only reason why we have four, six, and eight cylinder gasoline motors in our automobiles nowadays is because the two-cylinder, two-cycle motor did not prove efficient under varying conditions of load and speed.

"As every one knows, there are thousands of two-cycle gasoline engines of the stationary type at work, and it is really the better type, the more economical type for power rendered, and therefore the more efficient.

"Now, with this novel electric power plant, I do not see why we could not get back to the two-cycle motor for automobiles to be used in conjunction with the electric motor and with a very small storage battery between to act as a buffer, as it were. With such an arrangement we would have an equalization of the load on the gasoline engine. It would drive a generator at a practically constant load. The little storage battery would act as a sort of reserve supply in case of extra stress on the car, as in climbing hills, making speed, and so forth. It would be what we term in trolley-car service a 'floating' battery, floating on the system and rendering help when needed, but chiefly performing the all-important service of allowing the gas engine to work under nearly constant load.

"Such an arrangement would mean much lighter weight than even in the lightest of present gasoline cars because there is now so much waste power from the engine. A much smaller engine of only two cylinders could be used. In addition to this, carbureter adjustments would be at an end because the carbureter would not have to meet varying conditions of load

and of speed which corresponds to load. Also a much inferior quality of fuel could be used for the same reasons.

"What has led to the so-called gasoline problem has been the necessity of getting combustion at all speeds and under light and heavy load of the carbureter. It is probable that fuel nearly as low in the scale as unmixed kerosene could be used with satisfactory results in a car in which the power plant was of the combined gas-electric type described. The electric motor, as in the case of the purely electric car, would supply the differential, of course.

"Whatever may be its physical applications, this new form of power plant for electric vehicles is a big move in the right direction. It is simplicity itself and it appealed to me strongly for that reason when it was first brought to my attention. I believe that with it weight can be taken from the electric car to a surprising degree and that great efficiency of operation will be the result. It is progress when you get increased efficiency coupled with increased simplicity, and that is what we have here.

"As to the future of the electric vehicle," Dr. Steinmetz concluded, "it seems to me assured. We have seen electricity supplant other forms of power in the street car, the driving of machinery, the railroad. I believe it is destined to do the same thing for the motor vehicle. The electric car will be the general utility car."

DEFENSE OF "ARTIFICIAL" LEATHER

Representative of a Large Substitute Manufacturer Replies to Mr. Reilly's Criticism of Trade Names and Methods

In our last issue we published the opinion of Mr. Reilly, a Newark tanner, on imitation leather, with special reference to the misuse of the word artificial in connection with coated cloth or other materials made to resemble leather. We give space here to the reply which is of equal interest to members of this trade, where the use of leather substitutes is becoming a factor of considerable importance. The article is by George Frank Lord, of the Du Pont Fabrikoid Co., who says:

I am sure that it will be of great benefit to both leather manufacturers and artificial leather men to clarify the situation. We agree with Mr. Reilly that there is a vast difference between an imitation article and one that is artificial. But to deny that there is such a commodity as artificial leather is like the refusal of the backwoodsman to admit the existence of a giraffe which he was seeing with his own eyes. To declare vehemently, "There ain't no such animal" does not destroy it. Likewise, to declare there is no artificial leather does not get rid of the troublesome fact that millions of yards are annually delivering the service of leather, which we agree with Mr. Reilly is the only real test of successful artificiality.

Now, as every member of the Leather Association knows, the public has for years been ignorant of the nature of coated split leather, which is the product with which real artificial leather must compete. The manufacturer of artificial leather cannot successfully compete with coated splits without explaining what they are. Hence our campaign, "How Many Hides Has a Cow?"

There may have been misrepresentations in the sale of the leather type of upholstery materials, but certainly our effort has been and will be to tell the truth. We are surely not the ones it hurts. By all means let all of us tell the truth and shame the devil. So much for the academic and moral issues. Now for the practical. One gets the impression from Mr. Reilly's article that the leather business is being seriously damaged by the progress of artificial leather. In a previous issue of your publication I endeavored to show why leather manufacturers ought to welcome the best grades of artificial leather. And to an even greater extent should this be true of the manufacturer of leather goods.

Right now, without the stabilizing influence of artificial leather, the price of leather would be so high that it would no

longer be practicable material for upholstery purposes, and those lucky enough to own a pair of shoes would likely lock them in a safe every night. Then, too, all innovations must stand on their own merits, and no man, or association of men, can destroy facts by sophistry. If coated splits were not unsatisfactory to upholsterers, and artificial leather more satisfactory, mere words or paper and ink could not affect the replacement of one by the other.

The first large manufacturer of automobiles who discarded splits in favor of artificial leather did not do so on account of our advertising or sales effort (since we had not started the campaign), but because he was forced into it by the failure of coated splits to deliver the service he required. He has been using artificial leather exclusively for nearly two years on several hundred thousand cars and is entirely satisfied with it.

There will always be a bigger demand for good leather than all leather manufacturers can supply. They should be the first to desire that the excellent standing of genuine grain leather be not damaged by the well known weaknesses of the type of artificial leather known as coated splits. The only way to avoid such damage is to sell coated splits to the public as such, and advertise to prevent their sale as genuine grain leather. Think this over, gentlemen, remembering that the truth is the only sound basis for commercial progress. You not only can afford to have the truth told about coated splits, but you will in the end make money by promulgating it yourselves.

SHELDON AXLE & SPRING CO. RELIEF ASSOCIATION ANNUAL ENTERTAINMENT

Company Makes Money Gift, Raising Treasury Fund to \$7,000—General Manager Predicts Business Boom

The fact that about 1,500 employees of the Sheldon and members of the family attended the second annual entertainment of the Sheldon Relief Association speaks eloquently of the popularity and importance of this event given in the Y. M. C. A. Auditorium Thursday evening, March 25. Besides this there were a number of things happened at the concert and social.



Sheldon employees and their families at annual entertainment of Relief Assn.

The company, through its general manager, George M. Wall, made a gift to the Relief Association of several hundred dollars, sufficient to make the amount in the treasury an even \$7,000.

Mr. Wall spoke interestingly of the oft-repeated phrase, "Psychological Depression," and ridiculed the idea that the present depression in business was due entirely to the fact that business men, through the medium of thought, could cause a stagnation in big business over the whole country. His view of the future was an optimistic one and he declared that everything pointed to a "business boom" that is coming along soon.

T. H. Atherton, president of the company, attended and made

a few remarks, as is his custom. He expressed his sentiments on the capital and labor question, saying that he greatly enjoyed the spirit of the Relief Association, and hoped the time would come when the evils that tend to retard the efficiency of the workingman will be wiped out.

James Marshall, president of the association, explained the purposes of the association and introduced Howard Davis as chairman of the meeting, who presided in the absence of J. Fred Armstrong, secretary of the company.

George Nicholson, who was invited as a representative of the Vulcan Iron Works, of which he is treasurer, is also a director of the Sheldon Axle & Spring Co., and president of the Y. M. C. A., in which the meeting was held. He welcomed the audience from the angles of all these positions.

The secretary's report, which shows the actual strength of the association and the scope of its work, was presented by E. A. Jones. The receipts for the past year were \$2,178.48. The death and sick benefits were \$1,256.35, leaving a surplus for the year of \$922.13. During the eight years in which the association has been in existence the total receipts amounted to \$17,920.53 and expenditures \$11,173.78. Including the generous donation of the company, there is at present a surplus fund of \$7,000.

An orchestra of 14 pieces, under the direction of Wm. H. Luft, furnished the music. All of the expenses of the concert were defrayed by the company. Refreshments were served and a social time was had following the program, which was chiefly as follows:

William Delaney, accompanied by Mr. Wilcox, solo; Mrs. William Lloyd, reading; Mr. and Mrs. George Mason, duet; Miss Marion Fry, accompanist; Miss Anna M. Jones, soprano solo, accompanied by Miss Margaret Wall; Messrs. Marshall and Umphred, trombone duet; Arthur C. Jenkins, solo, accompanied by Miss Fry; Bryan Brothers, piano duet; Charles Gallagher, Scotch songs, accompanied by James Coyle; Messrs. Livingstone, Dempsey and McDonald, soft shoe dancing.

The date of the annual picnic was announced as July 31.

ST. LOUIS CARRIAGE AND AUTO ASSOCIATION HOLDS MEETING

The St. Louis Carriage and Auto Body Builders' Association held its regular monthly meeting and dinner at the American Annex the evening of March 16 with about 30 members present. John Cook, president of the association, occupied the chair.

Several speakers were introduced, including Henry Speck and Herman W. Klix, who told of the work of the association in establishing a technical course in wagon and carriage design at Central High School. Louis Moller, Jr., congratulated the association on its representation at the recent primaries, there having been six members of the association, candidates for nomination for aldermen. William F. Brinkman, democratic nominee of the Ninth Ward, was introduced and was later endorsed by the association. An excellent cabaret entertainment was provided.

TO EXPLOIT NON-GUARANTEED TIRE

The tire people are finding that there is an ever increasing tendency to abuse the "guaranteed mileage" feature of their goods and some steps will doubtless be taken in the near future to correct existing evils. The Consolidated Rubber Co. has taken the first step in this direction by planning a publicity campaign exploiting a "non-guaranteed" tire. A number of jobbers who have been approached have given their approval to the scheme. The Consolidated people explain that the absence of a guarantee will enable them to market their tires at a lower rate and that everybody along the line from the maker to the user will ultimately benefit. The non-guaranteed tires will, with ordinary care, average as high a mileage as the guaranteed goods, it is claimed, and there will be an incentive for the user to avoid abusing them unnecessarily. Many

of the claims on the makers of guaranteed tires have been manifestly unjust, but they have been taken care of rather than raise an issue which might reflect in any way upon the makers.

The scourge of the guaranteed tire maker, says the Trenton correspondent of the India Rubber World, is the legion of speeders who, relying upon the modern mechanism of their cars for quick control, speed up to within a short distance of the stopping point and then set powerful brakes to grind the very life out of the rubber. The improper adjustment of chains forms another serious problem for the manufacturers of guaranteed goods to cope with.

MANSFIELD TIRE & RUBBER CO. BUYS COLUMBIANA PLANT

The Columbia Tire & Rubber Co. has been organized to take over the property and assets of the Columbia Rubber Co., of Columbiana, O., which will be dissolved. The new company, capitalized at \$300,000—two-thirds common and one-third preferred stock—will be operated as an auxiliary of the Mansfield Tire & Rubber Co., of Mansfield, O., a majority of the stock being owned by the present management and stockholders of that company, and the board of directors of the Columbia Tire & Rubber Co. being practically identical with that of the Mansfield concern. The factory at Columbiana was completed two years ago, at a cost, with equipment, of about \$135,000, and is said to be one of the finest in the state, but it has never been operated. W. G. Henne, sales manager of the Mansfield Tire & Rubber Co., will become general manager of the Columbiana concern, and A. E. Krannach, formerly superintendent at Mansfield, has been appointed factory manager of the new plant. This purchase will not interfere in any way with plans for extension of the Mansfield plant.

AUBURN WAGON CO.'S NEW OFFICIALS

At a recent meeting of the directors of the Auburn Wagon Co., Martinsburg, W. Va., R. A. Bradford was elected treasurer and manager, to fill the vacancy caused by the death of Max Robinson. J. E. Wyndham succeeds Mr. Bradford as assistant treasurer.

Both have been connected with the company for a long period, Mr. Bradford having had charge of the sales department heretofore, while Mr. Wyndham has acted as superintendent.

There will be no changes in the general policies of the business and the trade may be assured of the same prompt attention to their requirements as heretofore.

Throughout the winter this company have been operating at full capacity and report business coming in in a very gratifying manner and prospects good.

AN ENGLISH CARRIAGE BUILDER'S FORTUNE

Mr. George Norgate Hooper, of Elmleigh, Hayne Road, Beckenham, a member of the executive council of the Victoria Dwellings Association, Ltd., who died on January 12 last, aged 89 years, left estate of the gross value of £95,084, with net personalty £72,636. The testator left to the South Kensington Museum two pictures of Venice by Rosier (a pupil of Ziem) and a view of the Tell Chapel and Lake of Lucerne in moonlight, by J. B. Crome, provided they be hung there to the satisfaction of his executors, and, failing the acceptance of this bequest, the pictures are to be given to some public art gallery in the enlarged city of Westminster, in Beckenham, in Exeter, or in Norwich. He also left £105 to the Middlesex Hospital in memory of an old friend, and stated that he made no further bequests to public institutions, as he preferred to make gifts in his lifetime, when he could watch and exercise some control over the expenditure.—London Times.

A COMPENSATING SPRING SUSPENSION

By Ernest E. Wemp*

It is a well known fact that the human organism is very susceptible to vibration of any character, particularly when the period of the vibration is high. Vibration, due to road inequalities is both the principal cause of passenger discomfort and the agent of destruction to the entire mechanism, and is the primal reason for the spring suspension of vehicles. It is reasonable to consider that passenger comfort is the true criterion for judging the road performance of a suspension system.

The movements of the axle systems of a vehicle must conform closely to the contour of the roadway they are traversing, thereby setting up rapid accelerations and retardations of the masses in the axle systems. In fact, it can be shown readily that in cars of standards design, disregarding the shock-absorbing effect of the tires, a vertical acceleration of the axle system of 550 feet per second may be easily obtained, and it is by no means certain that under conditions where the tire is releasing previously stored energy at the instant the shock occurs the vertical acceleration may not reach the above-given figure even with the use of pneumatic tires. An acceleration of 550 feet per second is 17 times that of gravity and it is evident that if it occurred in the passenger-carrying platform the effect would be intolerable.

While it is obvious that the ideal conditions for passenger comfort would be obtained by maintaining a constant platform level, it is likewise an established fact that platform movements do of themselves not necessarily mean passenger discomfort. It is only when these movements become rapid in period, causing sudden changes in direction and consequently rapid platform accelerations, that the action becomes uncomfortable to the passenger and racking to the entire mechanism. The ultimate object, then, of a successful suspension, regardless of the means employed, is to maintain platform vibrations of low period and consequently low accelerations and retardations.

Passenger comfort in spring-suspended vehicles is inversely proportional to the vertical accelerations and retardations of the passenger-carrying platform. The accelerating force of the mass of the axle system must be absorbed by the mass of the platform supported by it. Since acceleration is proportional to the mass, when a given force is considered, it is evident that the ratio of the unsprung mass of the axle to the mass supported by it should be as small as possible. From this the second fundamental may be expressed. Other things being equal, passenger comfort is inversely proportional to the ratio of the unsprung to the sprung weight of the vehicle. The qualification, "other things being equal," is inserted because many other conditions affect passenger comfort, the principal ones being:

- Length and periodicity of springs.
- Diameter of wheels.
- Size and degree of inflation of tires.
- Wheelbase of vehicle.
- Depth of cushions and quality of upholstery.

While the last-named factors influence road performance to a large extent, these remarks are based upon the first two fundamentals, and in any comparison between the compensating suspension and those of conventional design it is to be understood that as regards wheelbase, diameter of wheel, size of tires and period of spring vibration the vehicles are similar.

An analysis of the roadway over which a vehicle travels may also assist in giving a clearer understanding of the fundamentals of the suspension itself. A roadway consists of an equal number of elevations and depressions relative to a mean roadway. These may be termed positive and negative obstructions, since they induce axle accelerations opposite in sign. It is evident from the law of average that 50 per cent. of the

obstructions, simultaneously encountered by the axle systems must be opposite in sign, and, therefore, induce in the axle systems forces opposite in direction. The platform mass must absorb these. Why not arrange the suspension system so that the opposing forces can be made to counteract each other and thus reduce the resulting effect on the platform?

Fig. 1 is a side elevation of a chassis embodying the Wemp compensating spring suspension. The front and rear springs are of the half-elliptic cantilever type, pivoted intermediately to the platform M at the pivot points C and C'. The outer ends of the springs are connected to the front and rear axles respectively, and the inner ends are linked together by the tie-rod E. P and P' represent the load or force in pounds applied at the points C and C', due to the weight of the platform and its load. P and P' likewise represent the vertical reactions at the front and rear axle systems respectively.

Considering the points C and C' to be the pivots of the link work, then the force P creates a turning moment about C equal

$$P X$$

to $P X$ and an unbalanced force at H equal to $\frac{P X}{h}$, where

$$h$$

X is the moment of the force P and h the perpendicular distance from C to a plane passing through H and H'. Likewise P' creates a turning moment about C' equal to $P' X'$ and an

$$P' X'$$

unbalanced force at H' equal to $\frac{P' X'}{h'}$.

$$h'$$

The unbalanced forces at H and H' are opposing, and equilibrium of the system can be produced by connecting the

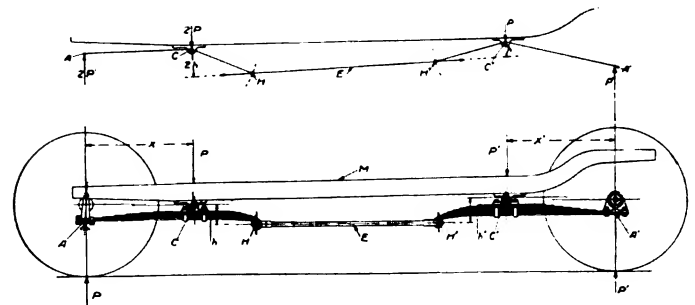


Fig. 1—Side elevation of a chassis, under load, illustrating the compensating spring suspension

opposing forces through the medium of the tie-rod E, when the force at H equals the force at H'.

The condition for static equilibrium may, then, be expressed algebraically by the equation

$$\frac{P X}{h} = \frac{P' X'}{h'}$$

An analysis of the system shows that the springs, together with the tie-rod E, form a draglink system in which a constant angular velocity of bellcrank A C H will produce a variable angular velocity of bellcrank A' C' H', and vice versa. Likewise the leverage-ratio of P : P' will vary with the angular movement of the bellcranks; for example, as (upper) bellcrank A C H is rotated about C, the value of h is increased and the value of h' at the same time decreased, until they are in the ratio of 2 : 1 or $h = 2 h'$. The equation for momentary

$$P X = P' X'$$

equilibrium then becomes $\frac{P X}{2 h'} = \frac{P' X'}{h'}$, and, since the values

of X and X' vary with the cosine of small angles and therefore but little, they may be neglected without serious error and the equation becomes

$$\frac{P}{2 h'} = \frac{P'}{h'} \text{ or } P' = \frac{P}{2}$$

That is to say, in the new position, the load at P must be twice as large as the load at P', in order to maintain equilib-

*M. D. Hubbard Spring Co., Pontiac, Mich.

Since the time and space through which F acts is known, the impulse and the work done by F are known; and it is necessary to assign to the components R' and O the same values of time and space, so that all of the kinetic relations of the force F and the sum of its components will be equal. These are expressed by the equations,

1. Force $F = R' + (+ - O)$
2. Impulse $F T = R' T + (+ - O T)$
3. Work $F S = R' S + (+ - O S)$

Of the two forces R and R' , it is known that they both act through T seconds and are opposite in direction, and R' is now assumed to be equal to R in magnitude.

It will now be well to eliminate the force F and substitute its components, considering each one as acting individually and combining the results. Consider, first, the component R' acting at A . It is resisted by an equal force R acting at C and produces a couple, whose arm is X . The moment of the couple

$$R' X$$

is $R' X$, and an unbalanced force at H equal to $\frac{R' X}{h}$ is cre-

ated. This unbalanced force is transmitted through the medium of the tie-rod to the rear bellcrank (rear-spring) and expended in acting upon the mass of the platform opposite the shock. It is seen that the force R becomes the vertical resistant to the force R' during the T seconds it acts, and is totally expended at the instant R' is expended. Therefore, there is no vertical movement of the pivot C from the force R' . All of the force R' is thus seen to be transmitted and expended in acting upon the end of the platform opposite the shock.

Now R' is R' parts of F ; therefore that portion of the shock force that is transmitted to the end of the platform opposite the shock is expressed by the ratio $\frac{R'}{F}$.

The component R' being totally expended (likewise the resistant R) the component $+ - O$ may now be considered. The component $+ O$ applied at A , finds no resisting force at C (since the total resistance possible has been expended). Therefore, there is no turning moment about C and all of the component $+ - O$ is expended in acting upon the mass of the platform supported at C , or the end adjacent to the shock.

$+ - O$ is $+ - O$ parts of F ; therefore, that portion of the shock force acting upon the end of the platform adjacent to the shock is expressed by the ratio $\frac{O}{F} = \frac{F - R'}{F}$. Since $\frac{R'}{F}$

and $\frac{O}{F}$ are the ratios of the division of the shock force F

to the ends of the platform opposite to and adjacent to the shock, it is clear that by multiplying the ratios by the common

space factor S their values are not changed, and $\frac{R' S}{F S} = \frac{R'}{F}$

ratio of work done at the end opposite to the shock, and $\frac{O S}{F S} = \frac{O}{F} = \frac{F - R'}{F}$

$\frac{O S}{F S} = \frac{O}{F} = \frac{F - R'}{F}$ = ratio of work done at the end adjacent to the shock.

Numerically speaking, the forces R' and R are equal, and so, neglecting the direction of the forces, $\frac{R}{F}$ = ratio of work done at the end opposite the shock.

$\frac{O}{F} = \frac{F - R}{F}$ = ratio of work done at the end adjacent to the shock.

The action of the system is thus seen to depend upon the value of R , that is, upon the inertia of the platform at the end receiving the shock.

In encountering a series of obstructions, it is evident that

R may have a value due to a previous shock. Likewise its value may be positive or negative. If the value of R' in the equation is made of opposite sign to that of R , the equation $F = R' + (+ - O)$ will satisfy.

From the above explanation shocks occurring separately or simultaneously may be analyzed, remembering to treat the shocks as occurring individually and combining the results.

In all of the explanations of the system the element of friction has been neglected. It was found during the experimental work that this element affected the working of the system to a marked degree. This fact led to the development of a type of bearing which has proved very satisfactory. It has merits worthy of a detailed explanation. Fig. 3 shows in detail the rear pivot bearing of the suspension. It will be noticed that the bearing bracket B , attached to frame F , is finished with a bell-mouthed hole of at least 1.5 times the diameter of pivot pin C , which in turn is secured to the rear spring by means of the spring plate D and clips G . A force diagram of the suspension will show a resultant bearing force in the plane $A B$, and the pivot pin will always ride in substantially this position. The action of the suspension is such that this force never reverses, thus permitting the use of a bearing of this type. The angular movement of the pivot pin never exceeds 15 degrees, and through this angle perfect rolling contact is secured. With rolling contact no lubrication is needed. One of the bugbears of spring suspensions is thus eliminated.

The tie-rod bearings at H and H' are of the same construction. Lubrication is eliminated from the entire system.

By making the frame bracket bell-mouthed and the pivot pin concave, another important constructional feature is ob-

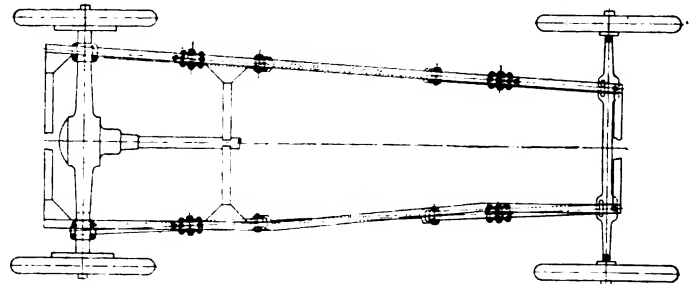


Fig. 4—Plan view of Fig. 1, showing straight line action of suspension system, which joins the front and rear spring centers

tained. Referring to Fig. 4 it will be noticed that the line of action of the suspension is on straight lines joining the spring center distance of the rear axle with that of the front axle. This, of course, makes the spring mounting at an oblique angle to the axles. With rigid pivot bearings lateral stresses and twisting of the springs would result when the axles play up and down. The rolling-contact type obviates this difficulty and permits the application of the suspension to practically any type of frame, while the straight line action of the suspension introduces no thrust forces.

It will be noticed that in all of the analyses given, the vertical component of the road shock alone has been considered. It is very important, however, that the horizontal component of the shock force receive consideration, and since in a vehicle using the cantilever type of suspension the leaves of the front springs must resist the horizontal component of the road shock by stresses of compression, it will be well to consider the action of the front axle system from the standpoint of horizontal stress alone. With reference to Fig. 5, the front wheel is encountering a positive obstruction V , and in surmounting it the axle system must rise S inches. The time required will be that necessary for the wheel to travel through space L . For the sake of simplicity it will be granted that the center of gravity of the platform mass lies in the horizontal plane of the pivot point C . C , therefore, could be made to resist the kinetic energy of the mass of the entire platform. It should

then be possible to measure the horizontal component of the energy lost in shock in terms of the total kinetic energy of the platform. When the obstruction V is encountered it is evident that the front wheel will tend to revolve about D as a center, and considering elasticity as lacking, the movement of A will be in the arc A O, having a radius A D equal to the radius of the wheel.

It may be shown from Fig. 5 that P N is the true horizontal component of the shock force. It may also be shown that if K E is the kinetic energy of the platform at the moment of impact, the proportion of the energy destroyed by the horizontal resistance may be expressed by the equation $P N = K E (\cos a)^4$

2

It will be noticed that the horizontal plane of the pivot C is below the plane of the wheel center A. The resistant to horizontal action is applied at A and the possible movement of the pivot C with respect to A will be in the arc C C'. When C reaches the position C' the horizontal projection X of A C will be shortened by the distance U. The decrease in the length of A C has a distinct shock absorbing effect, as it may be considered identical to the action of a spring working through a space U.

Having considered the action of the compensating suspension system under different load and shock conditions, the advan-

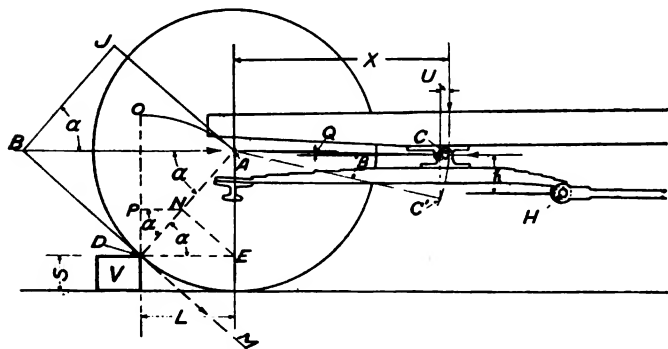


Fig. 5—Method of obtaining the approximate horizontal component of the shock force in terms of kinetic energy of the passenger platform, showing how this horizontal component is partially absorbed in the "give" in AC.

tages, both functional and structural, claimed for a system of this character, remain to be enumerated.

First, any shock force is divided and absorbed by the whole suspended mass, and the platform acceleration is thereby reduced. In comparison to this, in any conventional spring system, a shock force is absorbed by the mass of the platform supported by the axle receiving the shock. A simple relation between the two may be shown if it be considered that in both systems the mass of the platform is supported equally by both axles. Then if M is the mass resisting the shock in the conventional suspension, that is, the mass supported by the axle receiving the shock, a force F will produce an acceleration A,

the value of which is expressed by $A = \frac{F}{M}$, while in the com-

pensating system the force F is resisted by double the mass or 2 M, and the acceleration $A = \frac{F}{2 M}$. The accelerations are,

therefore, in the ratio of 2 : 1.

Second, road shocks of opposite sign occurring simultaneously are caused to counteract each other, thereby reducing the forces tending to accelerate the mass of the platform, and consequently reducing the platform acceleration and increasing the passenger comfort.

Third, vehicle springs in any suspension must be designed to carry a maximum load determined by the carrying capacity

of the vehicle. Passenger comfort increases as this maximum load is approached and decreases as the load diminishes. In the compensating suspension, as the passenger load is decreased and the spring action becomes rougher, the pivotal action of the mechanism increases, offsetting the stiffer spring action, passenger comfort being maintained to a marked degree.

Fourth, it is a well known fact that leaf springs are comparatively slow in action and incapable of absorbing rapidly occurring shocks. This is evidenced by the increasing use of auxiliary springs, whose function is to absorb the minute vibrations due to small obstructions encountered at high speed. In the compensating suspension these vibrations are absorbed by rapid pivotal movements of the springs rather than by spring flexions. This action is very noticeable in traveling over brick pavements or roads of like character at high speeds.

Fifth, a study of the force diagram of the compensating suspension will show that the forces applied tend to hold the wheels against the roadway at all times. This results in better steering action and improved traction, with a saving of tires on all the wheels. These constitute the more important functional advantages of the system.

Among the structural advantages may be mentioned, maximum wheelbase for any given frame length; low platform height with a consequent low center of gravity; minimum amount of unsprung weight on the axle system (since the thick portion of the springs is secured to the platform); a suspension system that is lubricationless, that cannot rattle and takes up wear in the pivot bearings automatically.

The advantage of the absence of non-adjustable bushings in a suspension system cannot be over-estimated.

With springs attached rigidly to both the axle and the frame, side shocks are transmitted with almost their entire intensity from the wheels to the platform.

The reaction to the tension of the tie-rod places the frame in compression between the pivot brackets, and since the compression forces act below the lower web of the frame the result is a trussing effect to the frame, which opposes the bending action due to the loads upon the platform.

If the drive is taken through the rear springs the shock of sudden accelerations and retardations, due to starting and braking, is reduced by converting a part of the energy, longitudinal in direction, into work in a vertical plane by the pivotal action of the springs.

WILL BUILD CHASSIS FOR THE TRADE

A new wrinkle in the automobile business is the plan of the Pontiac Chassis Co., Pontiac, Mich., a new concern whose incorporation was announced recently, to build for the automobile trade chassis minus bodies and tires. The customer receives the chassis in this form, mounts his own design of body and top, puts on the tires, and then sells the completed car under his own name. The chassis is built for assemblers only, and it is stated that by this method, the smaller assembler is enabled to produce a car at as low a price as the larger manufacturer.

The incorporators are R. A. Palmer, of Pontiac, formerly general manager of the Cartercar and Oakland companies; Robert Perkins, secretary of the Massnick-Phipps company, maker of eights and four-cylinder motors in Detroit, and H. H. Brooks, formerly sales manager of the Marathon Motor Works, Nashville, and later of the Herff-Brooks Corporation, Indianapolis. The authorized capitalization is \$100,000, and it is said that other Detroit and Pontiac capital is interested in addition to that represented by the above named principals.

The first design of chassis produced in the plant formerly occupied by the Flanders Mfg. Co., is a 25 horsepower type using the Perkins small four-cylinder engine, which has a bore and stroke of $3\frac{1}{4} \times 4\frac{1}{2}$ inches. It is an L-head engine with cylinders in a block and three-speed gearset in unit. There is nothing unusual about the chassis or its power plant, conventionally accepted practice being adhered to.

Paint Shop

TOUCHING UP AND VARNISHING NATURAL WOOD CAR

As regards touching up and varnishing natural wood work, it is a difficult job to undertake in most cases. Where a job has been taken care of, and there are no damaged bare parts to deal with of any account, it can be turned out of hands in a smart way.

But where a job has been allowed to go to an advanced state of shabbiness, and worn in parts so that water has gotten into the grain of the wood and discolored it, also, where the corrosion from screws and bolts has discolored and decayed the fibres of the wood in their immediate position, then the manipulative talent of the painter is called into requisition.

In such cases the work should be well flatted down in the first place, and the discolored parts given a coat of match staining to the character and color of the wood. Stain is made in a variety of ways, but chiefly of siennas and umbers. Van dyke brown is also good to make staining from, while on walnut panels or dark birch surfaces, with slightly discolored damagings, varnishes mixed with a little japan. make a very good stain, as well as feeding up the bate of the damaged parts of the woodwork.

Of course, all the stained parts can be worked up in the various coats of varnish until the surface presents a clean job free from the blemishes of patched-up work, and then finished in a full coat of finishing varnish.

Putties—A good putty is as essential in coach painting as a good color or a good varnish, and special work requires special putties as well as special varnishes. The commonly used putty is made of whitening and linseed oil, beaten to a working consistency. An oil putty, mixed with a little japan, is good for leveling the damaged parts of the rims of wheels; it dries hard and is tenacious and keeps the water at bay well. It does equally well for undergearing; a small proportion of tub lead improves it for this work.

But body putty should be made with japan only; it is more tenacious and becomes harder than an oil-made putty, and holds its surface firmer and does not soak and sink like a softer putty does. The stoppers are, of course, made of dry white lead, so as to be faced down with stone, and are bound with gold size which dries very hard but is apt to work out. while that bound with hard drying varnish is the best for this special putty for facing in body painting.

USE AND ABUSE OF SOAP IN WASHING AUTOMOBILES

I have often wondered why some of your writers have not touched on the above subject. It is certainly a matter of importance to every man who paints an automobile. We have here one of the best equipped garages in the state and we also have some of the finest automobiles in New York City come here.

I was in the garage one evening last summer and watched them washing automobiles. I was very much surprised. The washer had a large pail filled with something, and into this he dipped a large sponge with which he washed the auto. In his other hand he held a hose with running water.

The manager of the garage being a friend of mine, I asked him what the man was using and he informed me it was soap. I then asked him how long he expected the paint and varnish to stand such abuse, and he merely answered: "What need you care? It means more work for you."

Now, his statement was true all right, but most painters take too much pride in their work to want to see it abused in that way, even though it might mean more work, as he said.

Very few owners of automobiles understand anything about colors or varnish, so after the washer has spoiled the job, the owner will come back on the painter and inquire why the job does not stand.

I am writing this to let my brother painters know how automobiles are washed in most garages, as some may not know that automobiles are washed this way, but I understand all garages use soap.

We have here, in this place, eight or nine high-priced automobiles, and I wish you could see them at the end of the season. On some of them the paint and varnish are washed off down to the lead and on others down to the bare wood.

What can the poor painter do about it? Perhaps if the seller of the machine should caution his customers, it might be obviated to some extent, but how can the man in the garage be reached? However, you can start the ball rolling.—E. L.

CARRIAGE PAINTING NOTES

What is called japan brown color may be made by adding a little vermilion to japan black just enough to make the presence of the red apparent. This is a very rich brown, and on it striping of vermilion or orange look well.

Another nice brown may be made with chrome yellow as the base, and adding a little Indian red, French ochre, burnt umber, and white enough to be apparent; the red warms it, and the umber gives it its brown tone. By adding more or less of the leading colors this brown may be varied.

To get a good carmine job, ground the work with English vermilion, making the ground perfectly solid with the vermilion; then grind some pure carmine in a little drying oil, and put in some flowing body varnish; apply the color very carefully. It will take two coats to produce a good solid body. The carmine, of course, makes simply a glaze, having no sufficient body to do otherwise.

Speaking of glazed colors, you can use green also, as well as carmine, claret, ultramarine etc. Lay a light green mound, and use a green lake to glaze with.

To make a facing putty for small defects, mix whiting, a little white lead, litharge, of which a very small amount, and japan driers, and a drop of oil; work quickly into a mass, and use at once, as it sets soon. This putty will allow of rubbing down soon after it is laid, and will not tear up under pumice and water.

If you wish a good cheap purple, try mixing vermilion and Prussian blue, adding a very little white lead. Vermilion and black give a cheap plum brown; same for claret; and looks passably well.

In striping gears, wherever a line comes to a nut head, say, let it go right over or on to it, and then fine lines can follow on or near edges of broad line, and around the outer edges of nut. For a fine effect, run a hair down the middle of the broad stripe; if the latter is black, run a deep orange, or pure white, or gold stripe down the middle.

Black color-and-varnish should not contain too much color, as all black are poor driers, and when finishing if varnish is applied over a color-varnish containing too much black it is apt to part with some of its lustre.

The heavy stripe is not to be advised when painting a business wagon, and it is good taste as well as practice to observe a uniform style of striping throughout the job.

If you have poor success in making your varnish go wrong, throw open your varnishing room to all chance callers, let there be no door to it, let the temperature get low down in it, let it get high, don't let it stand still doing nothing—keep it on the move, let the fire go out now and then, open the windows on stormy days.—Decorator.

HOW TO TEST TURPENTINE

The following test is exceedingly simple and practical, and can be relied upon. In a graduate tube place a turpentine known to be absolutely pure and in another tube put some of this turpentine, adding to it some naphtha. If a small lump of potassium iodide is placed in each tube it will be noticed after a lapse of 24 hours that the crystal of potassium iodide has remained perfectly white and unchanged in the pure turpentine, while it will have turned yellow in the tube which contained turpentine and naphtha.

THE B. F. GOODRICH CO. ELECTION

At the regular annual meeting of The B. F. Goodrich Co., held in New York, March 10, a resolution reducing the number of directors from 16 to 14 was approved. O. C. Barber and Phillip Lehman retired from the board, and four other directors—Henry Goldman, A. H. Marks, A. H. Wiggin and B. G. Work—whose terms had expired, were reelected for three years.

A special meeting of stockholders was held on the same day, at which resolutions were adopted for a reduction of preferred stock from \$30,000,000 to \$28,000,000.

The directors elected the following officers for a period of one year: President, B. G. Work; vice-president and general manager, A. H. Marks; second vice-president and sales manager, H. E. Raymond; second vice-president and works manager, E. C. Shaw; secretary and assistant treasurer, C. B. Raymond; treasurer, W. A. Means; assistant secretary and assistant treasurer, Guy E. Norwood; assistant sales manager, W. O. Rutherford; auditor, William Murray.

After making liberal provision for all maintenance charges, depreciation, bad debts, and all outstanding liabilities, etc., the company's net income for the period, as shown by the profit and loss account, was \$5,440,427.00, compared with \$2,599,747.39 in 1913.

TECHNICAL SCHOOL EXHIBITION

The Technical School for Carriage Draftsmen and Mechanics at 20 West 44th street, New York City, held on April 8 its annual exhibition of work done during the past season by the students. The exhibition attracted many hundreds of people during the few hours it was open, men from the various vehicle factories and body-making shops forming a large part of the attendance.

Many of those present are yearly visitors and they pronounced the exhibition the best they had seen. There are 13 graduates this season, seven from the day class and six from the evening class. A correspondence department is kept open the year round.

All inquiries in reference to the school should be addressed to Andrew F. Johnson, 20 West 44th street, New York City.

EFFECT OF TIRES ON ROADS

"Wide tires build up roads and save horse labor," states the department of agricultural engineering of the Nebraska university farm, in a recently issued bulletin. "They have the same effect upon a country road as a roller on a plowed field. On the other hand, the narrow tire cuts up a road like a disk. It has been found by actual test in this department that the wide tired wagon pulls easier in nearly all cases than the narrow tired wagon. In deep mud, on a country road, the wide

tired wagon pulls 6.2 per cent. easier. On a country road with a thin surface of mud or deep dust, however, the narrow tires pull 4.9 per cent. easier. In a corn field the wide tires pull 30.5 per cent. easier; in an alfalfa field, 17.7 per cent. easier, and on a dry country road 10.3 per cent. easier."

NORTHWESTERN OHIO DEALERS MEET

Charles E. Merkel, president of the Houghton-Merkel Co., of Bucyrus, O., was elected president of the Tri-State Vehicle and Implement Dealers' Association, of District No. 25, at a meeting held at the Central Hotel at Galion, March 2. The district is comprised of the counties in the northwestern part of Ohio, and includes Marion county.

Other officers elected were G. W. Armstrong, of Shelby, vice-president, and W. H. Shyrook, of Mansfield, secretary and treasurer.

W. P. Rathborn, of Springfield, was present at the meeting and gave a very instructive talk on the cost of doing business and on other matters of interest to the dealers.

LOOK FOR GOOD TRADE IN THE SOUTH

Realizing that business will be unusually good in the south when business does open up, the Parry Mfg. Co. has secured the services of Mr. G. Moseley, with headquarters at Birmingham, Ala., to represent them in Alabama and Mississippi.

Both Mr. Garman and Mr. Thomas, traveling for the Parry Mfg. Co. in North and South Carolina and Georgia respectively, are putting forth renewed efforts and are much elated over the results of their work the past few weeks. Dealers are beginning to forget about the European war and are preparing themselves for a good buggy season and are now specifying stock orders for immediate delivery.

QUICK DEATH FOR JITNEY REGULATION BILL

The bill intended to regulate the operation of jitney busses in Pennsylvania had a brief existence in the legislature. On Tuesday, March 30, it was negatively reported from the Committee on Roads. This bill would require owners of busses to give bond to cover all possible damages and would impose a tax of ten per cent. of the gross earnings. It is said the traction companies in several of the biggest cities in Pennsylvania were behind the bill. On the other hand, most of the civic and commercial bodies in the state opposed the bill and were active in expressing their disapproval to the state assemblymen.

McINTYRE COMPANY IN HANDS OF CREDITORS

The W. H. McIntyre Co., Auburn, Ind., owners of the Imp Cycle Car Co., is now in the hands of a committee of creditors appointed at a recent meeting. The committee has taken full charge and installed its own superintendent and accountant, and W. H. McIntyre no longer dictates the policy of the management. It is the intention to manufacture a light car to sell at from \$700 to \$800 and to discontinue entirely the Imp cycle car.

STRAIGHT SIDE TIRE GAINING IN POPULARITY

Records of sales by the Goodyear Tire & Rubber Co., of Akron, O., show that the straight side tire is making a great gain in popularity over the clincher type, sales of the former amounting to about 65 per cent. of the total in 1914, while the present season shows about 83 per cent. of the new cars using this straight side type of tire. In 1913 about 50 per cent. of the new cars were equipped with Q. D. clincher tires and rims.

S. A. E. STANDARDS COMMITTEE MEETING

Outline of Work at Detroit Meeting to Be Held on April 22

At its meeting to be held in Detroit on April 22, the Society of Automobile Engineers Standards Committee, which consists of 150 automobile and automobile parts designers and producers, 11 of the 14 divisions or sub-committees will make reports or submit communications formulated at meetings held prior to the meeting of the whole committee.

The recommended practices and standards of the Society of Automobile Engineers have been of incalculable benefit to the automobile industry at large. They reduce and simplify labor, the work in the engineering department being safer and more rapid. They help in the purchasing and assembling departments, as well as in the designing department. The use of the standards is, naturally, extending very widely.

Much smaller stock and fewer sizes of solid and pneumatic tires, for example, are needed, fewer jigs and tools. There is no doubt that metals used in motor car construction have been reduced in price by the makers, due to the fact that the standards have thrown a great many specifications which were nearly identical into one group, thereby enabling the makers to develop a business of some magnitude in some one composition, whereas before they were trying to satisfy everybody and not getting anywhere. The benefit that can be directly seen is the avoidance of the necessity of producing steels to specifications which, while they matched each other in efficiency, so nearly approached each other without exactly coinciding, that it seemed impossible for the steel producers to come anywhere near the position of being able to carry any material in stock to supply the requirements of the automobile trade. Several grades of steel have been popularized by S.A.E. specifications. High priced branded steel is less used probably saving millions of dollars. It has been estimated by an authority that steels to S. A. E. standards can be bought at probably 15 per cent. lower prices than before the specifications were adopted. A great deal of light has been thrown on the subject of alloy steels, which has resulted in much wider use.

It is better for all parties concerned to adopt something that is regular. It goes without saying that in some establishments the effect of standardization is greater than in others. There are indubitably innumerable details of automobile design which can and should be standardized. The cost to the consumer of screw gages is not one-third what it was under the old system when the specialty manufacturers were compelled to make gages to meet the varying requirements of their customers.

The S. A. E. standards encouraged truck wheel manufacturers to equip their plants with new machines which can now be used effectively to produce more and also more nearly perfect work. Before the adoption of the standards each wheel had to be made to fit each individual band and for each make of tire a different width was required. Only few manufacturers were prepared to furnish large sizes; consequently there was little competition. These conditions have been changed; a number of wheel manufacturers are now equipped and competition compels them to pay close attention to the cost of production, competing with one another in price as well as quality. Most wheels are now not only cheaper but also of far superior quality. At least 20 per cent. of the reduction of price of motor truck wheels is due primarily to the adoption of the S. A. E. standards.

Electrical Equipment

At Detroit the Electrical Equipment Division will report on the proper limitation of headlight illumination in cities. In several of the cities ordinances have been passed defining permissible "glare" of headlights. The S. A. E. committee will attempt to set forth the conditions of proper car illumination, particularly on the relatively dark streets and parks found in many of the large cities. Tests will be made of some of the dimming, shading and screening devices now on the market,

as illustrating the principles under consideration. It is also the intention to refine further the standards of bulb cases, sockets and connector plugs for the sake of better interchangeability and consequent improved operation. In addition, the possibility of standardizing the arrangement of engines for attaching starting motors will be taken up.

With regard to international standards of pneumatic and solid tires, the question is a commercial as well as engineering one. It is not, however, more commercial than many other standards, for the essential purpose of all standards is commercial. There are two kinds of formula, the fundamental which is based on abstract facts and the empirical which is based on the average current practice. It is possible to establish either fundamental or empirical standards. The vast majority of standards in use today are empirical, although some are fundamental, as, for instance, U. S. S. and S. A. E. standards screw threads. The Society of Automobile Engineers has been extraordinarily successful in establishing empirical standards. The international tire question is so complicated and of such importance that it seems a proper subject for fundamental treatment; in fact, it is likely that here only a fundamental standard has any chance of world-wide adoption.

Iron and Steel Division

New data are expected from the Iron and Steel Division on the physical properties of S. A. E. alloy steels, as well as further recommendations as to specifications of steel castings, and the vanadium minimum limit in vanadium steels. It has been suggested that a standard tooth form for silent chains be adopted. The importance of this is realized by car manufacturers using more than one make of chain. As it is now, it is absolutely necessary for them to have differently cut sprockets for each make of chain, to get proper results. It would be of great advantage if the chain makers would adopt some standard, and a report as to the feasibility of doing this will be made at the coming meeting of the S. A. E. Standards Committee.

The need of co-ordinated design and production of electric as well as gasoline vehicles is appreciated. The Electrical Vehicle Division of the society made a report involving fundamental considerations last January, but this report was, owing to the development of a marked difference of opinion among the engineers, referred back. A revised report will be made this month on speed and mileage ratings, motor voltage, efficiency tests of solid tires, and number of cells in standard battery equipment.

A subject of considerable economic value which is under consideration by the Research Division of the Standards Committee, is that of tap drill sizes. A common saying in regard to taps is that 90 per cent. break instead of wear out. This means not only large tap expense but expensive delay in getting new taps and resetting machines, and, not least by any means, the costly processes used to remove broken taps and the expensive pieces rendered useless by having broken tap-ends left in or having the tap holes spoiled in an attempt to remove the taps. This waste is almost wholly unnecessary, being avoidable by properly designed taps and proper sizes of tap drill holes. There are many arguments in favor of a tap drill list which can be applied in automobile practice generally. The Research Division has now in preparation an extensive series of tests to be conducted with tapped holes of varying depth of thread, and test pieces of different steels with S. A. E. and U. S. S. threads cut thereon.

Springs

The Research Division will also report finally on the matter of a vehicle taxation formula.

One of the most complex elements of car construction is leaf springs. The Springs Division is now formulating for consideration at the Standards Committee meeting at Detroit a report on:

Nomenclature of cantilever springs;

Test of parallelism of eyes and master leaf of leaf springs;

Modification of eye and bolt tolerance for leaf springs;
 Frame brackets for leaf springs;
 Offset of center bolts of leaf springs;
 Nuts for spring clips of leaf springs;
 Modification of center bolt standards for leaf springs;
 Width of springs for pleasure and commercial cars;
 Center bolt nuts of leaf springs;
 Length, opening, etc., of spring clips of leaf springs;
 Spacing of clips;
 Pressure blocks.

One of the hard working divisions of the committee, the Miscellaneous Division, will report on:

Dimensions of piston ring grooves;
 Hose and hose clamps for cooling systems;
 Flat fan belt widths;
 Dimensions of mechanically-driven air pumps;
 Sizes of screws and bolts for use in mounting dash-board fittings;
 Position of number on motors;
 Thread tolerance;
 Cotter pin sizes;
 Speedometer-drive shaft-ends.

It has developed that there are a great many unnecessary and immaterial dimensional differences in piston ring widths and thicknesses. Standard sizes of hose and hose clamps will be of great advantage. There is need for specifying a list of flat fan belt widths which would reasonably be used, and of setting forth the permissible variation in these widths, the latter being an apparently simple but not clearly understood point. It has been stated that in the mounting of dashboard fittings one diameter of screw or bolt with a specified style of head and pitch of thread is sufficient. With regard to the position on a motor of its number, it has been found that in the case of stolen cars, it is important that the police shall know where to look for the number of the motor, which for this purpose should obviously be at an easily seen place. This is an example of advisable recommended practice which is important in one way, while very trivial in another.

The matter of thread tolerance of machine screws and bolts is one that has never been settled, largely for the reasons that different grades of work require different standards in this connection, and that in any case an accurate method of thread measurement must be devised, this measurement involving several variables.

It is expected that after settling on a list of sizes, the Miscellaneous Division will report that instead of carrying 200 cotter pin sizes in stock as is now frequent practice, 20 should suffice for any car manufacturer.

There appears to be no good reason why the shaft-ends of speedometer drives furnished by the various instrument manufacturers, should not be standard, so as to interchange on a given make of car.

Several features of carburetor fittings have been standardized by the S. A. E. Subjects now before the Carburetor Fittings Division are:

Exhaust manifold hot-air jackets for carburetor connection;
 $\frac{1}{2}$ and $\frac{3}{8}$ inch carburetor outlet connections;
 $2\frac{1}{2}$ and 3 inch carburetor flanges;
 Uniform dimensions from center to face of side-outlet carburetors.

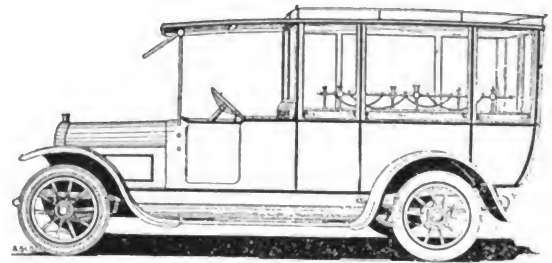
As the standardization of automobile parts has been extended and become broader in scope, the procedure of the Standards Committee has become necessarily more formal. However initiated, proposed new standards or revisions of existing standards must issue as reports from the particular division within whose province the matters properly belong. No action affecting the substance of reports is taken by any division except at meetings called for the purpose. The reports consist of complete but concise statements of the practices, constructions, etc., recommended, together with such illustrations and explanatory remarks as are necessary. After passage by sub-committee and committee and the approval of the council of

the society, the reports are voted on by the society in meeting assembled for submission by letter ballot to the voting membership of the society.

Intelligent standardization does not tend to stagnate design and restrain progress. It is thoroughly justified by the benefits redounding in an ever widening world wide market through more economical production of better cars.

ENGLISH HEARSE DESIGN

Although some of the motor hearses now being built copy to a large extent the characteristics of the corresponding horsed vehicle, we think on the whole there is a tendency to modify much of the ornament usually associated with this type of vehicle, and make it more like a private carriage. In our design the usual hearse rails and pillars are retained, as well as a mirrored edging to the coffin platform. All glasses are fixed, but it is a simple matter to make them detachable if a



conversion to an open hearse is required, but this is a type of vehicle seldom asked for now; also, in some cases the front lights are made to hinge forward in case the coffin is longer than usual. The coffin platform is 7 ft. 4 in. long, and the body is 44 in. wide overall, while the double doors at the rear allow for an opening 35 in. deep. The body side is $27\frac{1}{2}$ in. wide, the platform being a further $3\frac{1}{2}$ in. higher. The clear headroom inside is 2 ft. 9 in. The wheelbase of the 34 in. wheels is 11 ft. 6 in., of which 8 ft. 5 in. is behind the dashboard. —Automobile and Carriage Builders' Journal.

FEBRUARY EXPORTS NEARLY 100 PER CENT. GAIN OVER 1914

February exports show that 1,502 trucks valued at \$3,022,482, as against 57, valued at \$83,461 in 1914, and 2,230 passenger cars, valued at \$1,785,330, as against 2,837 in 1914, worth \$2,378,494, were shipped abroad. During the eight months' period ending February, the exports of trucks increased from 493 valued at \$797,722 in 1914, to 4,974, valued at \$14,411,924 in 1915. The passenger car exports decreased from 16,390, valued at \$14,919,487 in 1914, to 9,134, valued at \$7,593,429 in 1915.

The figures show that, while truck exports are increasing at a tremendous rate, the passenger car exports are rapidly declining on account of a possible lack of transportation facilities.

FIRESTONE ADDS TIRE FOR ELECTRICS

A new tire designed especially for use on electric pleasure cars has been developed by the Firestone Tire & Rubber Co., Akron, O., and was recently placed on the market.

The new pneumatic is built up with unusually heavy gum cushions between the layers of fabric to provide a high degree of resiliency; the construction is worked out with a view to obtaining the greatest possible economy of power, and the makers state that the result has been very satisfactory. But one type of tread is used—the Firestone dual tread, in which there is a central depression between two raised sections.

The prices, in some of the more popular electric car sizes, are as follows: 34 x 4. \$34; 34 x $4\frac{1}{2}$. \$40; 36 x $4\frac{1}{2}$. \$43.

A LOT OF AMERICAN CARS

We may publish in an early issue of this journal descriptions of further interesting commercial vehicle chassis imported from America, says Commercial Motor, of London. It has been evident now for some time that the competition from this source is assuming considerable proportions. The following list of such chassis, which covers most of those with regard to which inquiries are being made, or agencies established, and which is lengthening daily, is already a formidable one; it does not include several British assembled American trucks nor others which contain American-made components combined with some of British make: The B. A. Gramm, Chase, American Daimler, Dayton, Federal, Schacht, G. M. C., Gramm, Indiana, Jeffery, Kelly, Knox Tractor, Maccar, Modern. Overland, Packard, Peerless, Pierce-Arrow, Reo, Signal, Speedwell, Wajenhals, White, Morton. Reference must be made to battery vehicles, including Edison, G.V.C. and G.M.C.

Before the American trucks go into active service in the French army they are slightly modified at the central depot. In every case the trucks are supplied fitted with a canvas hood on hoops extending sufficiently forward to protect the driver. This is not found satisfactory. Either a partition is put up just to the back of the driver, or independent hoods are made for the driver and his mate. Being simpler, the former plan is more often adopted. With a one-piece hood the driver has a certain amount of protection from wind and rain, but he is practically in the position of a man standing in the mouth of a narrow alley down which a gale of wind is blowing. Generally the American hoops are lacking in rigidity; thus they are strengthened by nailing three or four longitudinal wood members to them along each side. It has long been the French idea to have sufficient rigidity in the hoops that stretchers could be suspended from them. This is done in the regular French subsidy types, the hoops being fitted with rings to receive the stretcher hooks, although it does not appear that a very great use has been made of them for this work. The American hoops are too light, however, even when strengthened, to allow of any load being carried from them.

Much more importance appears to be attached at the present time to the use of lorries for carrying able-bodied soldiers. All the lorries going to the front are fitted with a couple of fore and aft seats each one being a few inches from the center line of the vehicle, so that 20 to 24 men can be carried back to back. This arrangement places the load in the most central position, and gives the greatest comfort to the men, for they have ample room at their feet for placing rifles and kit. The seats are all temporary and are made to be taken out and attached to the side of the body, where they will not interfere with the carrying of an ordinary load of supplies or ammunition. The fact that these trucks are to be used for the conveyance of troops is another reason why the front should be closed, otherwise the men have to travel in a strong draught, and perhaps in a cloud of dust.

It is obvious that no change can be made in the mechanical features of the American trucks for the French army. Indeed, the French War Office has never sought to tie manufacturers down to one particular type, but has laid down general lines and given full latitude as to technical details.

VALENTINE EDUCATIONAL EXHIBIT AT SAN FRANCISCO

Valentine & Company, New York, have an educational exhibit at the Panama-Pacific Exposition, comprising a complete series of varnish tests. The exhibit is made with the co-operation of W. P. Fuller & Co., San Francisco, sales agency for the Valentine varnishes on the Pacific slope and the Hawaiian Islands. The tests made lay special emphasis on the qualities necessary in a varnish to withstand water and weather conditions. It shows to every visitor witnessing the tests that Valspar has extreme powers of resistance to water and all destruc-

tive agents that are likely to come in contact with a varnished surface.

A number of interesting tests are exhibited, among them the Valspar submarine test, in which the Valspar remains absolutely unchanged after other makes of varnish have gone to pieces; the running water test, where the varnish is given the same treatment as it would get if it were on the exterior of a rapidly moving motor boat; the water and weather test, in which a number of panels are coated with different makes of varnish and exposed for six months to the alternate action of water and weather.

The panels are laid face down in water for one week, then taken out and exposed to the weather, face up, for a week. Then back in the water, then out in the weather again, and so on, changed every week, for six months. This test produces more closely than any other actual conditions of service, with fog, rain, spring dew, etc. A set of these panels, which were tested from the end of July, 1914, to the end of January, 1915, so that they have been through both summer heat and winter cold, show a startling result. The Valspar has come through the test practically unharmed, while the other varnishes used in the test cracked or turned white, some of them going to pieces before the test was half over. Valentine & Company believe that no more conclusive proof of the worth of Valspar for exterior work could be offered.

From the point of view of the vehicle manufacturer, possibly the most interesting test shown is the one in which two automobile wheels, mounted one above the other, are used to show the destructive action of soap on varnish. Six of the best known makes of gear and chassis varnishes were striped on the alternate spokes of the two wheels and numbered one to six. Then on every other spoke was put Valentine's vanadium chassis finishing varnish and lettered V. C. F.

One wheel, when dry, was revolved in a tank of soapy water (the solution being of the same strength as an ordinary garage cleaner) for a period of 36 hours. At the end of this time it is asserted that all the varnishes, except Valentine's vanadium, had gone to pieces. This test conclusively shows the soap resisting qualities of Valentine's vanadium chassis finishing varnish, as used for the under parts of automobiles. The untested wheel clearly shows the comparison with the tested one after the experiment was over.

Four handsome sets of panels are shown in the San Francisco exhibit; one set showing the mirror-like finish of Valspar over different varieties of wood; another set showing seven of the beautiful Valspar enamel colors. The other two sets of panels show some of the Valentine automobile colors under glass.

It is stated by Valentine & Company that all the tests shown in the exhibit were made with varnishes purchased in the open market during the spring of 1914, and in their application and subsequent tests were all treated exactly alike.

ENORMOUS BALANCE OF TRADE

Merchandise Worth \$113,203,172 Sent Abroad Through the Port of New York in February

The exports of the Port of New York during the month of February amounted to \$113,203,172, the greatest total in the history of the port. They exceed the January total by \$9,177,907. The figures show that during the month domestic merchandise worth \$109,493,487, and foreign merchandise worth \$3,709,685 was exported from that port.

Excess of Exports

The Department of Commerce reports that the total imports of the country during February were \$125,123,391 and that the exports were \$298,727,757. The excess of exports over imports was \$173,604,366, against \$25,875,369 in February last year, and more than double the next largest February export balance of \$83,004,381 recorded in 1908. Of the February imports 63.9

per cent. entered free of duty, against 62.56 per cent. in February, 1914, and 53.4 per cent. in February, 1913.

Record of Ten Years

The following table gives a record of our American foreign trade in merchandise for the month of February, during the last ten years, by comparison:

	Exports.	Imports.	Excess Exports.
1915.....	\$298,727,757	\$125,123,391	\$173,604,366
1914.....	173,920,145	148,044,776	25,875,369
1913.....	193,996,942	149,913,918	44,083,024
1912.....	198,844,326	134,188,438	64,655,888
1911.....	175,957,305	121,694,740	54,262,565
1910.....	124,558,030	130,117,980	*5,558,957
1909.....	126,051,734	118,653,526	7,398,208
1908.....	167,757,032	84,752,651	83,004,381
1907.....	159,517,221	123,005,683	36,511,588
1906.....	131,766,558	104,232,879	27,533,679

*Excess of imports.

Enormous Trade Balance

Official figures show that since last September our export trade balance as against imports has increased from an excess of about \$16,000,000 until at the close of February it exceeded our imports by \$173,604,366. The table herewith shows the course of our American foreign trade balances during the past twelve months:

	Exports.	Imports.	Excess Exports.
1915—			
February	\$298,727,757	\$125,123,391	\$173,604,366
January	267,801,370	122,265,267	145,536,103
1914—			
December	245,632,558	114,656,545	130,976,013
November	205,878,333	126,467,062	79,411,271
October	194,711,170	138,080,520	56,630,650
September	156,052,333	139,710,611	16,341,722
August	110,367,494	129,767,890	*19,400,396
July	154,138,947	159,677,291	*5,538,344
June	157,072,044	157,529,450	*457,406
May	161,732,619	164,281,515	*2,548,896
April	162,552,570	173,762,114	*11,209,544
March	187,499,234	182,555,304	4,943,934
February	173,808,468	149,937,011	23,871,457

*Excess of imports.

A TREMENDOUS BOOM PREDICTED IN EXPORTS TO GERMANY FOLLOWING WAR

The Weekly Report, published by the American Association of Commerce and Trade, of Berlin, contains the following in its issue of March 20 on the aspect of the German-American trade:

Authorities agree that America is rapidly approaching the point of saturation in her domestic markets, at least so far as present demands on the normal conditions are concerned.

It is obvious, therefore, that America must either curtail the capacity of her factories, which would result in the throwing out of employment millions of wage earners, and in the disorganization of complementary industries as well, or America must depend upon the exploitation of foreign countries for the relief of her congested home markets.

Consequently and in realizing these conditions American manufacturers are making great effort to extend their exports, as is shown by the activities of numerous exporters' associations and other commercial bodies.

There are no hard and fast rules that can be followed in export trade expansion and it would seem natural that the experience gained by other exporting countries should be utilized. It would mean waste and folly to begin where other exporting countries left off 20 years ago.

The present European conflict has cast its shadow upon America's commerce and trade with far-reaching effect, which is the strongest proof that America cannot afford to lay too much stress on the slogan "Made in U. S. A." as applied to her home markets. Such trade name means the exclusion of foreign goods. How can any country reasonably expect to

sell its goods in a foreign land if the export efforts of this very foreign land are viewed with envy or prejudice?

Every exporting nation should append to its particular trade slogan the ever-golden rule: "Buy and Sell," for if you will not buy, you will not sell.

The trade name "Made in Germany" is not of German origin. It was forced upon Germany. Germany does not ask for the stamp of origin on any imported goods. This means that as far as Germany is concerned, to let the merchandise speak for itself. The quality counts in the first place, then the price, and no one will ask where they are made.

The trade slogan of a country, applied to its home trade, is of one-sided nature, because it should be borne in mind that any good rule works both ways.

Exporting countries depend upon each other and even America, rich in natural resources, cannot afford to ignore the warning which is manifested in both the present state of exports and of her domestic market.

In scrutinizing the future of American exports into Germany, it can safely be said at the outset that soon after the war a tremendous boom may be expected.

Three conditions, however, govern this desirable and hoped-for situation, viz:

First, that the friendly political relations of old between America and Germany continue.

Second that the same commercial relations continue, unharmed on either side by prejudice or envy.

Third, that American exporters deal with their German customers direct, and not through London, as was often the case before the war.

In regard to the first item, any sane person does not expect anything but continuation of the old, never disturbed friendship between the two countries.

The second item calls for tolerance on the part of both countries, and efforts in this direction, combined with intelligent study, in order to widen the export possibilities, will surely lead to splendid results.

The third item represents but the natural results of the attitude of the English government which now prohibits any commercial intercourse with Germany. American exporters, who have surrendered sales privileges for Continental Europe to business houses in England, will, in the future, have to do their business with the representatives in Germany direct.

DEATH OF INVENTOR OF "TWO-MINUTE" SULKY

John J. McNulty, Carmel, N. Y., died at the Post Graduate Hospital in New York City, March 2. Mr. McNulty was born in Kells, County Meath, Ireland, on March 6, 1859. His early education was obtained in Ireland, and when in his 'teens he came to the United States, where he found employment as a blacksmith and wheelwright.

In 1884 he went to Carmel, N. Y., where he was employed in the carriage business. By the year 1893 Mr. McNulty had built his own shop and later on added a large carriage repository to the establishment. Here his business branched out and general repairing and overhauling of all kinds of vehicles were added.

Mr. McNulty developed a number of very promising trotters, which he drove at various county fair grounds and carried off first money in many events. In 1900, he invented a new sulky cart for trotters. He made the cart himself and placed on it the elliptic arch from wheel to wheel, under the seat, which he had patented, and this cart was known as the McNulty two-minute cart. Many other improvements were made from time to time, and in 1904 he secured another patent on a hub of his own design. He manufactured a large number of these sulkies, and the one bearing his name still ranks among the first on race tracks throughout the country. Besides the racing sulky, he made a number of other models of carts for breaking young horses.

Mr. McNulty gave up the carriage business in 1905 and opened a garage. He built several small cars for himself during his years in the garage business. The last one that he completed was a large truck, which he used for towing disabled cars, as well as for many other useful purposes. Another car of his own manufacture is of the runabout style.

Mr. McNulty leaves four sons, who grew up with him in the carriage and automobile business, and who will carry on the extensive business commanded by their father. Mr. McNulty never sold the patents on his racing sulky, although he was offered large sums for them. He leaves these to his family as a part of his business heritage.

WM. H. RONINGER RETIRES FROM ACTIVE BUSINESS LIFE

Having resigned his position as manufacturing manager of the Banner Buggy Co., St. Louis, Mo., on April 1, and disposed of his financial interests in that company, Mr. Roninger will henceforth seek rest and quiet in private life. His desire to resign from active service has been strong for two years past, and the past eight months trouble he has experienced from neuritis has finally induced his present course of action.

He expects to build a cottage on his property on the Snow Islands, 25 miles north of Mackinac, where he plans to spend his summers. His winter home will be California; his real home, however, will be in St. Louis.

Mr. Roninger has been largely responsible for the success of the concern which he has served so long and faithfully, and leaves that institution with the best wishes and the love and respect of every member of the organization. "Uncle Bill," as he was affectionately known by many of those in the accessory trades, has perhaps a wider acquaintance and more friends than any man in the vehicle industry, having been a popular and efficient president of the C. B. N. A. during the past year.

Mr. Roninger will be succeeded by his brother, E. L. Roninger, in the purchases. Leo Moore will have charge of the manufacturing in the Banner plant, and Russell E. Gardner will be more active than heretofore in the general management of the business, shaping the sales and advertising policies; his orders and ideas along that line being carried out by his son, Russell E. Gardner, Jr.

NEW FUELS FOR GERMAN AUTOMOBILES

On March 15, in accordance with a recent order of the Bundsrat, about 25,000 automobiles will cease operating in and about Berlin, writes Vice Consul Daniel J. Waters, from Berlin, under date of March 6. This step has been taken to conserve the supply of benzine [gasoline], benzol, and rubber.

Many German technical men are of the opinion that in a very short time a great variety of fuels will be used in automobile engines—fuels that up to the present have been used only for stationary explosion engines. They believe that conditions brought about by the war will result in discarding the more expensive motor fuels, especially benzine.

It is stated by the same authorities that pure benzine has not been used for years, having been superseded by a fuel originally known as "mononaphtha," in which the pure benzine is mixed with other oils. This mixture has come to be known as "benzine," "automobile benzine," or "heavy benzine." Motors have been adapted to this heavy fuel. Benzine would have been replaced long ago by benzol, which is a coal-tar product, if the manufacturers of benzol had not bound themselves by deliveries to foreign countries. However, many automobile owners still believe that the use of benzol is harmful to their machines.

Much interest has been taken in the subject of mixing the materials now available in reasonably large quantities. The use of pure petroleum or pure alcohol is not considered, as the supply of neither can be considered unlimited. Regarding the use of mixtures, the following information has been obtained:

Benzine and benzol can be mixed with petroleum as well as with alcohol, and four different homogenous fuels can be produced by such mixing, namely, (1) benzine-petrol, (2) benzine-spirit, (3) benzol-petrol, and (4) benzol-spirit. As benzine and benzol may also be mixed, the four mixtures mentioned may also be mixed—(1) with (3) or (2) with (4). In this way fuels can be obtained that are composed of three of the original fuels—benzine-benzol-petrol and benzol-benzine-alcohol. These two liquids, as well as the four first named, are perfectly homogenous.

Tests have been made with the mixtures of benzine and petroleum, and it was found that no changes in the ordinary motor was required. When alcohol was added, however, a perforated lead disk was attached to the float, and an especially effective warming mechanism was attached. The benzine-petrol-spirit can be used up to the last drop, with the motor always working well. Mixtures of half benzol and half alcohol and of one-fourth benzol and three-fourths alcohol have been tested with less satisfactory results, although with some changes, including the elimination of the ventilator, real progress is being made.

AGAINST SPECIAL SALES DAYS AND DEALERS' OPENINGS

The National Implement and Vehicle Association has sent out the following communication to its members:

We wish to direct your attention to the timely subject of dealers' openings and special sale days. This is a problem which the sales managers' department of the National Implement and Vehicle Association has been studying for nearly two years. It has been their conclusion, as expressed in numerous resolutions, that such openings and sale days are seldom, if ever, productive of increased trade; that the trade secured on such days would have been secured in the regular course of business if aggressive salesmanship were employed all the time instead of on one day, and that the expense to dealer and to manufacturer eats up a large percentage of the profits. This view has been concurred in by several of the State Dealers' Associations and by the National Federation of Implement and Vehicle Dealers' Associations. The resolution of the Federation at its meeting in October, 1913, was as follows:

"Dealers' Opening and Special Sale Days—Realizing that the special sales days and openings, as usually conducted, are an unnecessary expense both to the dealer and manufacturer, and that the results are not commensurate with the effort put forth, we recommend to our constituent associations that they use every effort to discourage the practice."

At the meeting of the Sales Managers' Department, held in Chicago, February 16, 1915, the matter was up again for consideration and the result was an endorsement of the stand previously taken by the introduction and passage of a resolution to such effect.

The question is, however, one which devolves upon the manufacturers and dealers for individual decision. The decreasing number of sales days and openings is evidence that they are not of permanent benefit to the trade.

GOOD ROADS CONVENTION IN TORONTO

The Canadian and International Good Roads Association held in Toronto, March 22-26, its second annual convention and exhibition. Among the organizations taking part in the convention was the American Road Builders' Association, and among the speakers were nine highway engineers and road builders from the United States. The program for the sessions of five days, held in convocation hall of the University of Toronto, embraced the chief topics concerning the best methods of constructing modern highways.

When it is borne in mind that large expenditures for road building are not likely to be made in Canada during the war,

this convention, with an enrollment of more than 800, must be regarded as quite successful. The exhibition was an interesting feature of this large gathering. In a hall and a lobby adjoining convocation hall were displayed models and photographs of road construction and improvement and of implements and machinery for such work. In a tent 80 x 160 feet erected in front of the hall could be seen road-building machinery and equipment of the latest types, some of the machinery being in actual operation.

Most of the American manufacturers of such machinery have found it necessary to establish branch works in Canada to meet the needs of road builders in this country.

KENTUCKY WAGON CO. BUILD AUTOS

The Hercules motor car, formerly manufactured by the Hercules Motor Co. in New Albany, is to be manufactured in Louisville by the Kentucky Wagon Mfg. Co., and will be distributed by the Hercules Sales Co. from Louisville. Within a month, it is said, the wagon manufacturing company will be turning out an average of 25 cars a day.

The Hercules Sales Co., including W. W. Massey, A. H. Ross, James R. Duffin, Charles L. Carron and others, has been created over the patents of the Hercules Motor Car Co. Mr. Duffin, who is interested in the sales company as well as the wagon manufacturing company, represented his associates in arranging the deal for the manufacture of the car for the Hercules Sales Co.

Cars of the roadster and touring type will be turned out. President R. V. Board, of the Kentucky Wagon Mfg. Co., says that it is able to turn out the Hercules cars with its present force. For some time it has been manufacturing an electric for commercial service.

The Hercules motor and the electric are but two of vehicles of numerous types which the Kentucky Wagon Mfg. Co. has been turning out. It has been taking on a number of new lines and has been on the alert to extend its business in every line of vehicle endeavor that it is equipped to handle. Its most recent achievement of note was the turning out of 12,500 kitchen wagons for the French army.

AN ATTRACTIVE BOOKLET

The Du Pont Fabrikoid Co. has just issued an attractive and interesting booklet on Fabrikoid. Its cover, while of paper, is a striking reproduction of leather. It shows five different colors and grains of Fabrikoid.

The information in the booklet is of great importance to any one who is thinking of purchasing or making anything usually made of or upholstered with leather. Some of the subjects given attention are, "How Many Hides Has a Cow?" "How Du Pont Fabrikoid Is Made," "Motor Quality Fabrikoid for Automobiles," "Craftsman Quality Fabrikoid for Furniture," "Fabrikoid for Bookbinding," and "Fabrikoid Dekoart and Muralart for Walls."

The booklet is well printed and illustrated and will no doubt be in demand.

ANNUAL ELECTION OF CINCINNATI CARRIAGE MAKERS' CLUB

The Cincinnati Carriage Makers' Club held its annual election of officers at the Business Men's Club, that city, on March 11. Such a lively contest for votes was exhibited that it was said the meeting resembled an old-time primary election.

The judges announced the following as successful in the governorship race: Charles Fisher, of the Eagle Carriage Co.; Emil Hess, of the Sayers & Scovill Co.; George W. Huston, of The Spokesman Publishing Co.; M. J. McNamara, The Cincinnati Panel Co.; and C. J. Rennekamp, The Monarch

Carriage Goods Co. All the new officers are hustlers and may be expected to increase the activities of the club.

The address of Hon. Louis P. Pink, state senator, on "Legislation and Business," was the feature of the meeting and was delivered in an interesting and entertaining manner.

The governors of the club met on March 24, at the Business Men's Club and elected the following officers for the ensuing year: President, Clen Perrine, Brown Carriage Co.; first vice-president, Chas. A. Fisher, Eagle Carriage Co.; second vice-president, George W. Huston, The Spokesman Publishing Co.; treasurer, Emil F. Hess, Sayers & Scovill Co.; secretary, Clarence Rennekamp, Monarch Carriage Goods Co.

PHILADELPHIA VEHICLE BUILDERS' MEETING

The regular monthly and twentieth annual meeting of the Carriage and Wagon Builders' Association of Philadelphia was held on Friday, March 19, at the hall of the Pfaelzer Casino, 1217 North Seventh street, Philadelphia.

On this occasion a smoker and entertainment was held and all Philadelphia vehicle manufacturers, whether members of the association or not, were invited to attend. Quite a number of them accepted the invitation.

An elaborate entertainment, in which the best of talent was employed, occupied the evening, and a bountiful lunch was served during an intermission. Music was furnished by a local orchestra. A business meeting was held during the early part of the evening, at which the officers for the ensuing year were elected.

RECORD OF INVENTIONS

The annual report of the Commissioner of Patents shows that in 1914 there were received 67,774 applications for mechanical patents, 2,454 applications for design patents, 176 applications for reissues of patents, 8,851 applications for registration of trade marks, 988 applications for registration of labels, and 434 applications for registration of prints. There were 41,660 patents issued, including designs; 190 patents reissued, and 6,817 trade marks, 719 labels and 338 prints registered. The number of patents that expired was 22,098.

The total receipts were \$2,251,892.82. The expenditures were \$2,000,770.12. The excess of receipts over expenditures during the calendar year ending December 31, 1914, amounts to \$251,122.70. The surplus will probably be still larger during the coming year.

DEATH OF COLONEL KANE

Colonel Delancey Astor Kane, a descendant of John Jacob Astor, and called "the father of coaching in the United States," died at his home in New Rochelle, N. Y., on April 5, aged 69. He inherited several millions of dollars from the Astor estate. He was graduated from the United States Military Academy in 1868. Throughout his life he was an ardent lover of horses and was an international authority on coaches, harness and finely bred coach horses. He frequently drove his coaches over the 100 miles of road between New York and Philadelphia. Col. Kane was an honorary member of the Carriage Builders' National Association.

BUICK 1915 OUTPUT SOLD

Buick dealers have been informed by the Buick Motor Co., Flint, Mich., that the entire output for 1915, 42,000 cars, has been disposed of and that it is impossible to increase any one's original allotment. The 1916 Buick models will be announced in June instead of in August, as has been the custom of the company thus far. It is rumored that a production of at least 60,000 cars is being planned, or 18,000 more than for the season 1915.

HOW FREE PORT WOULD INCREASE FOREIGN TRADE

Discussion of the Relation of "Market Ports" to World Commerce Here and Abroad

(From *The Americas*, published by the National City Bank)

New York stands statistically as the world's greatest port, but as a market for commodities and merchandise it takes a place behind London and Hamburg and, in a way, is hardly of greater importance than several minor European cities. It is the chief gateway for the foreign commerce of the United States, where raw materials and manufactures produced in this country go to be loaded upon ships for transportation to other countries, and where the products and merchandise coming from other lands for use by our own consumers arrive and are either transferred direct to railways or held for domestic sale by importing merchants. But it is a port of comparatively minor importance as an international trading center such as London and Hamburg, whither great quantities of commodities and manufactured goods converge from all parts of the world, to be sold and distributed again to other far corners of the world. It handles little of real overseas trading commerce.

It would be of great advantage to the manufacturing industries of the country if we had a great seaport, or financially co-ordinated group of ports, which, in addition to their services in the handling of in-and-outbound commerce, handled a considerable entrepot trade, as merchant between other nations. A nation that has manufactures of its own to sell can make good use of the organization of trade and transportation that such a market-port furnishes—as Germany has used Hamburg to distribute its manufactures. And if it has a port which is a great world-market for raw materials, such as London is, its manufacturers have the pick of the supply brought to their front doors and an advantage in price, because other nations' manufacturers must come there to buy and must carry the raw materials home. The command over world-wide commerce exercised by London and Hamburg through their organization of banking and marketing and shipping has been more to the good of the industries of England and Germany than any other influence to be named.

There have been several leading reasons why the United States has not developed any such market-port as London and Hamburg. One of the reasons was sufficient of itself to prevent the development. That reason has now disappeared through the establishment of the nation's new co-ordinated banking system with the authorization by law of direct foreign branch banking and of the use of "acceptances" in foreign trade. The Federal Reserve Board has already adopted a broad and liberal policy in encouragement of foreign trade through the use of acceptances—members have indicated a disposition to permit the use of acceptances in the case of the accumulation of commodities in anticipation of export, even. It is human nature—and, particularly, American human nature—to be skeptical over a statement that the adoption of some mere system or form will work as wonderful a change as the legalization of the "acceptance" in our banking system makes possible. It can be asserted, however, that American commercial banking is now in a position for the first time to offer the services to the world's international trade that London and Hamburg have offered, so that merchants of other countries may consign their goods to our markets for sale in international trade upon the same security and terms that they have taken advantage of with absolute confidence in trade through London and Hamburg. And already American merchants in certain lines are soliciting consignments of the commodities they handle, and anticipating the establishment of markets in New York.

Power in Foreign Trade

One does not have to go but a very little way into the study of Great Britain's and Germany's commerce to see how vastly

important the general overseas trade carried on in the markets of their great ports has been to them, not only industrially, but even politically. Their foreign commerce, and especially their great general trade, have made them as powerful as they are, and to their great port markets they owe their commerce.

Their manufacturing industries were crude until they developed export, and their export industries amounted to very little before London and Hamburg built up their world-wide sea merchandising. At first, the merchants of these ports sent their ships a-trading everywhere, the merchant fleets returning with the products of far-off countries, which were filled into the picturesque ancient storehouses that are still to be seen adjoining the older parts of the harbors. The fleets went out again with such of these products as were tradeable, also with home products and manufactures. And again returned laden with foreign goods.

So London and Hamburg, Antwerp, Amsterdam, and a dozen other sea-port cities became market centers where a great diversity of products and goods were to be found. As commerce grew, their ships multiplied and the ships of all the world went there because there was always the market, both for selling and for buying. And it is so even to this day, for as world-trading markets they have not stopped growing in importance. London's docks and sea-faring stores are a sight to see, even for tourists visiting them only for pleasure. The picturesque sailing vessels of the old time are giving way to great steel steamers, but there are some of them to be seen even now.

Re-export Commerce

They are there because the Englishman and the German is still as much trader as manufacturer. It is the impression of some authorities on foreign trade that the importance of the business of London and Hamburg as entrepot markets is a thing of the past, compared with their business in handling the exports of the industries of their own countries and imports of raw materials for the use of these industries and for consumption. It is true that the bulk of their business is with direct export and import. But statistics show that the business of merchandising between other nations that both England and Germany does is today increasing. It is a little more than keeping up its proportion of growth in the whole commerce of the two countries. England's total foreign commerce, including its import and re-export of foreign and colonial goods, averaged \$6,121,499,319 a year from 1909 to 1913, and \$5,036,973,264 from 1904 to 1908. The average of re-exports was \$498,431,527 from 1909 to 1913, and \$393,827,376 from 1904 to 1908. Exports of English products averaged \$2,220,763,559 and \$1,760,406,839. The re-export commerce, counting the value of goods only once, grew from 9.2 per cent. of the total of all the other commerce to 9.7 per cent., and from 22.3 per cent. of the value of exports of English products to 22.5 per cent.

British and German Trade Figures

Of the goods moving seaward out of London during the five years ended with 1912, re-exports averaged \$243,635,267 yearly against \$380,202,981 worth of English exports. In the previous five years it was \$202,222,106 worth of traded products, against \$316,207,925 of the produce of English industry. The statistics of the port of Liverpool show an annual average of \$127,395,810 in re-exports against \$682,599,168 of English products in the later five-year period and \$98,526,556 in re-exports against \$692,964,494 direct exports in the preceding five-year period. London's re-exports rose in value from 63.9 per cent. to 64.1 per cent. of the exports. Liverpool's rose from 14.2 per cent. to 18.6.

The trade figures of the German Empire do not give such details as do the British statistics. But the "special" exports are ordinarily subtracted from the "general," to give German re-exports. There are also "special" imports. German statistics for 1907-11 show average yearly re-export trade of \$153,672,832, against "general" exports of \$1,841,373,792 and total commerce of \$4,086,820,058. In the 1902-6 period it was \$90,-

812,757 against general exports of \$1,383,285,763, and a general commerce of \$3,052,527,378. Thus Germany's entrepot trade grew from 6.5 per cent. of the exports to 8.3 per cent., from 2.9 per cent. of the whole commerce to 3.7 per cent.

These statistics of England and Germany show that this kind of commerce is growing with and a bit faster than their growing direct exchange of products. It should be remembered that for years they have had highly developed banking facilities and merchant navies providing the world direct lines of transportation to them.

The re-export trade of the United States is now exceedingly small. In 1913 it aggregated \$37,377,791, only 1½ per cent. of all exports and ⅞ per cent. of all the country's commerce. A large part of it was "trade" only to the extent of passing across the country in transportation. It has been actually decreasing in proportion to the whole trade. The largest single class of products re-exported was fruits and nuts, aggregating \$4,800,000. There was \$4,291,410 worth of rubber re-exported. In 1909 we re-exported \$1,145,229 worth of coffee, but this trade had dwindled to less than \$500,000 in 1913.

London and Hamburg give to the trade of the countries they represent services that are much the same but performed in different ways.

Hamburg's Free Port

Hamburg's community of merchants and bankers has carried up to a modern development the system of the old merchant-mariners. Typically, it is a community of great foreign-trading houses that have their branches and correspondents in different parts of the world. They have a close co-operative organization through which they keep in instant touch with trade over the entire globe. They co-operate also to the extent of giving each other the benefit of their individual trading organizations. There is no community of merchants anywhere else that has Hamburg's system of immediate expert espionage of selling and buying opportunities everywhere and Hamburg's free-masonry of execution of trade. When one merchant has not, in any part of the world, direct selling connections of his own, for any goods he desires to distribute, he can find another merchant who has, and can command, on reasonable terms, the best use of the other merchant's facilities.

Hamburg has a great merchant marine. Out of the shipping lines of the old "merchant princes" have developed the present systems that reach over the whole world and converge at the port. The German government and Hamburg's community of merchants have seen to it that these lines were established, even when they did not at first pay, and have compelled business to them by subsidy, by influencing traffic to them through inland rail and water rate concessions, and by lavish use of capital to establish trade to feed them. They were of sufficient advantage to Hamburg and to Germany. The shipping lines are an essential part of Hamburg. It and they are simply the twentieth century counterpart of the business of the former merchant trader. The capital for them has been raised by the Hamburg merchant community. It can afford a few particular losses, here and there, on the transportation, in view of the trading profits accruing.

Authorities in Germany's commerce say that it is largely through the instrumentality of this trading system that her export has been built up. It has furnished the means for a practical co-operation of all Germany's industry in both selling and buying abroad. By the co-ordination of export and import and transportation activities under common control German industry has reached great economies of production and distribution. Her merchants have had both to buy and sell in getting their markets. It has frequently been advantageous to take more products in exchange than Germany could herself use. The entrepot trade of Hamburg and other cities like it has made a market for these. It has given business to German ships. It has helped pay the expenses of the export and consumption commerce. It has brought the German merchants into touch with business activities of other countries that they have been able to use to furthering Germany's own exports.

The Port of London

London, with other co-ordinated market-ports of England, serves England's industries through a measure of control over the world's traffic in important raw materials. The world comes to her open markets to sell and also to buy. In 1912 there was \$1,339,744,969 worth of raw materials, not including foods, consigned to English ports. Of this \$327,010,114 worth was re-exported. The United States sent about \$347,000,000 worth, of which about \$30,000,000 was resold. The United States bought from England, direct, some \$136,000,000 of raw materials (not including foods), of which about \$23,000,000 was produced in the United Kingdom and \$113,000,000 came through England's markets from other parts of the world. We brought about \$172,000,000 of all kinds of goods through England's markets.

Among the hundreds of things that England traded in, coming from her colonies or other countries and re-exported, we find 6,337,669 pounds of pepper, 13,787,908 pounds of raw cocoa, 52,812,682 pounds of tea, 3,266,518 pounds of tobacco, 337,941,504 pounds of ordinary wool, 36,680,432 sheep skins with the wool on, 66,324,642 fur skins, 2,418,043 pounds of quicksilver, 323,801,100 pounds of raw cotton, 922,746,000 pounds of palm oil, 977,956,000 pounds of tallow, 725,989,000 pounds of rubber, 120,924,000 pounds of undressed leather, 2,504,480 pounds of cork. The wool was worth about \$70,000,000, the cotton about \$50,000,000, the rubber about \$80,000,000, the furs and skins about \$40,000,000. England's total exchange of food, drink and tobacco was about \$75,000,000. She handled about \$34,000,000 worth of tin in this outside trade. None of this includes any part of nearly \$100,000,000 worth of goods transshipped in England under bond. In a study of England's trade, London, Liverpool, and other markets must be connected together as co-ordinated markets, with London as the controlling center, for commodities traded at London are often warehoused in other English ports.

Trade in Raw Materials

Now, while London has its great merchant-bankers and trading-houses like Hamburg, and Hamburg handles in its mercantile exchanges great quantities of raw commodities as London does (it re-exported in 1907 about a fifth as much wool, a fifth as much cotton and a third as much rubber as England did), the organized overseas trading through merchant houses is typical of Hamburg and London's great typical entrepot trade is in her open auction markets to which the world sends its goods and comes to buy. The highly developed manufacture of cotton, woolen and rubber goods, for instance, today requires a mixture of the different types and grades of the raw materials produced in different parts of the world.

Take cotton. The United States produces the bulk of the world's cotton, but in 1912 we bought nearly \$25,000,000 worth of it in the English market. It was Egyptian cotton, for the most part, needed by our manufacturers for its long staple and other distinctive spinning qualities to mix with our own. England gathered into her marts immense quantities of our product, in the varying grades, and most of the Indian and Egyptian output. There, so to say, it was all mixed to make the lint cotton of up-to-date manufacture. England's own manufacturers got their choice. The United States took much Egyptian. England resold 648,000 bales of American to continental manufacturers. A precise study of transportation and market costs would probably show that the English manufacturers got ALL their cotton at a lower price than our New England factories got theirs.

London can be said to exercise a large control over the wool supply of the world through the organization of the central market for it there. In normal times most of the wool of Australia is auctioned in local market ports, but much of this goes to London and a vast amount is consigned direct by primary shippers to the English mart. Australia has sent around 300,000,000 pounds yearly. All the British possessions send about 650,000,000 pounds a year. The world sent 810,494,862

pounds in 1912. Of this 472,553,358 pounds went to English manufacturers and 337,941,504 pounds were sold in the English markets to non-English manufacturers.

Why do not the manufacturers of other countries buy their wool direct? They do, in a great measure, but there is an economic feature of the world's woolen industry that calls for a market like London's. Even to a greater extent than in cotton manufacture, the making of fine fabrics requires a choice of the varying wools of the whole world. United States manufacturers buy in Australia direct, but they buy also in London to supplement the direct purchases. London gets a great fraction of the whole world's output, gathers it together, assort it expertly and honestly and grades it, and the world has found this service worth going to London and paying for.

Shipments of Rubber

The world's market for raw rubber is controlled in London. There have been markets in other European cities—at Antwerp and Hamburg and in Holland, but since plantation rubber has taken an important place, London's market has been supreme. The United States used, last year, something over 60 per cent. of the world's rubber output. About 65 per cent. of the world's rubber output is plantation rubber. This is raised mainly upon the plantations of England's possessions in the Far East. In the raw rubber situation we find another instance of what it means to a nation's trade to have capital invested abroad. England went heavily into rubber plantations about five years ago. There was a "rubber boom." Speculation ran so high that the rest of the world made a little fun of London over it.

Development of Plantations

The result was a great development of plantations—it seemed at one time an over-development. Now it is said in the rubber trade that the world can use all the rubber they produce. Wild-rubber gathering is in a slump, not because of lack of demand, but because its production costs are so high that with the cheap plantation rubber on the market its gathering cannot be made to pay. Up-to-date rubber manufacture, like cotton and wool manufacture, requires the mixture of different sorts and allied gums; also supplies of many necessary chemicals and other raw materials. England has made the market for all these. No doubt its manufacturers have got their rubber cheap through having the market in London and nearby. But in the present war crisis England has another advantage out of her control of rubber through investments in plantations that nobody anticipated. She has been able to force from our own rubber manufacturers, in return for permitting them to buy in her market, the agreement that they will not sell a pound of it or of any other rubber they get to England's enemies.

London has the advantage of what has been called "the impetus of her historical pre-eminence" in finance and commerce. She has a highly developed organization of experts and the trust of the world in the integrity, the high professional sense of honor, of her brokers and merchants. The latter is a part of London's and Hamburg's capital. There are many other converging forces—forces that have converged for years. It may not sound good in the United States, but one of the most potent of these is London's vast community of speculation—the community with a great volume of capital to use in a wide range of speculative activities surrounding the markets for nearly every commodity in the world.

These are organized speculative markets. London's banks loan vast sums on commodities—hides, sugar, dried currants, nuts—held in London on speculative account. London carries from year to year vast stores of food and raw materials, buying them when the world's prices are low, selling when scarcity comes anywhere. A highly organized speculative market takes whatever is offered for sale upon it—the "long" side is compelled to protect itself when it doesn't buy because it can get its commodity cheap.

Money Always Available

So the merchants of all the world have known that they could consign their commodities to London and get money at

once, either by sale or by loans from the banks on warehouse receipts. To a certain extent, the same thing has been true of Hamburg, and of smaller markets. London's speculative community has thus performed a great service to the world, and especially to England. It has helped keep all the world's commerce moving. It has indirectly supplied the liquid capital for all kinds of trade. But for England alone it has provided the reason why the world's greatest streams of ocean shipping converge upon her co-ordinated group of ports (England is really one market), giving her, without cost and without the necessity of organizing a special system of lines like Hamburg's, the means of direct, speedy, cheap transportation for all her commerce to every point in the world.

London fixes the world's prices—or strongly influences them—in commodities that do not enter her port at all. There is a speculative copper market in London. England imported about \$40,000,000 worth of copper in 1912 and re-exported only \$5,000,000 worth. The speculative market is in "rough" copper—not the metal of real international commerce. But the great copper users of the whole world use this speculative market to "hedge" in against real purchases made direct. Consequently the speculative quotations are taken by the parties in real transactions as the consensus of the world's opinion about the value of the metal, and while they are not bound by it, it influences them considerably. In silver, though only a small aggregate of the real metal is cleared, comparatively, London really fixes the price, by consent of the world.

New York's Possibilities

To get back to New York and what it may become as a market for raw materials and foreign products to serve the country's industries as London and Hamburg do: What are the possibilities, now that we have the banking machinery, for drawing hither a goodly share of the world's commodities?

New York will have to match London's expertness and professional integrity as well as her banking facilities, and convince the world of it. She will also have to find a way to establish direct lines of economical transportation, such as London and Hamburg have, to match their market economies. Both London and Hamburg are "free ports"—at least Hamburg has a free port area—so that incoming foreign goods may be reshipped reassorted and perhaps partly manufactured and then re-exported without the impediment of customs examination and bonding or the cost of the use of the money put up for duties till withdrawal. London and Hamburg have equipped and are further equipping their harbors with the most modern mechanical appliances for loading and unloading ships, at the minimum expenditure of labor and time.

Hamburg has apparently been able to make headway against the prestige of London in establishing herself as a great market. There is no reason why New York cannot do likewise, not as a rival of London, but through her own merits and for the definite purpose of serving the country's industries.

Definite attempts have been made by foreign merchants cut off from the Hamburg markets to consign raw products here.

For a number of years, a fur trade and industry has been making headway in this country, with markets at St. Louis and at New York.

The English wool embargo has compelled United States interests to seek supplies in South America. This will naturally be the beginning of a certain amount of direct shipment that will persist in any case.

United States rubber manufacturers have already tried to bring about direct shipment of the raw material from the Far East, in connection with direct shipment of tin. They have not succeeded well, for English investment interests control both the tin and the rubber, and the preference for London as a market has been sufficient to hinder the plans greatly. But if the English rubber growers insist on selling through London only, United States investment money may in time develop the rich plantation possibilities of Central America and the West Indies.

Free Port Needed Here

The Merchants' Association of New York has started a movement for a free port here. With a free port and the acceptance privilege, the cost of raw materials to manufacturers may be greatly cheapened, since the acceptance gives the possibility of minimum carrying charges based on the cost at arrival, the free port cutting off the additional cost that the tariff places upon goods until the time of actual use and leaving the stock free for resale at any time. New York's harbor costs for transshipment and for loading and unloading are now high. There is cheap land and ample waterway from Sandy Hook to the head of Newark Bay and along the New Jersey water front for excavating of modern harbor basins and construction of extensive railway and pier connections with the most modern electrical devices.

The United States needs the direct shipping lines—a merchant marine. A constructive national program to foster one which would attract the co-operation of business interests would bring it about.

BILL PROVIDES METRIC SYSTEM

Senator Dillon Would Put the United States Standard of Weights and Measures on Basis With Other Countries

An attempt has been made to work up some opposition to the Dillon bill, which provides for the metric system as the standard of weights and measures. The bill will affect every manufacturer in all lines and as it is brief, it is published in full. The bill follows:

Sec. 1. Be it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled, that the weights and measures of the metric system shall be the sole standard of weights and measures in the United States on and after July first, nineteen hundred and twenty; provided, that in the meantime such metric system shall be permissive.

Sec. 2. That all equivalents between the units of the metric system and the system now in common use throughout the United States shall be calculated from the fundamental relation, one meter being equivalent to 39.37 inches and one kilogram being equal to 2.204662 avoirdupois pounds.

Sec. 3. That the Director of the Bureau of Standards, with the approval of the Secretary of Commerce, shall prescribe rules and regulations for carrying out the provisions of this Act, and shall prepare and promulgate tables based upon the fundamental relation established in section two showing the equivalents of the weights and measures of the metric system to those of the system in customary use in the United States.

Sec. 4. That any person, corporation, company, society, or association who shall use, or offer and attempt to use in any industrial or commercial transaction in the sale or purchase of any commodity any other weights and measures than those of the metric system on and after July first, nineteen hundred and twenty, shall be guilty of a misdemeanor, and upon conviction thereof in any court of competent jurisdiction, shall be punished by a fine of not more than \$500 or by imprisonment for not more than three months, or by both such fine and imprisonment.

Most countries throughout the world use the metric system. The only exceptions of importance are the United States and Great Britain and her colonies. The change to the proposed system will not mean a change in the sizes of anything. It will simply mean the changing of the method of designating the size.

Not long ago an American firm sent a representative to South America to sell shirts and collars. The representative obtained large orders and wrote his firm that all sizes must be designated in the metric system. He found the necks of the South Americans fit the shirts all right, but only the metric system could be used. The firm filled the orders with goods marked in inches and the South Americans declined to receive them.

Necessarily, the change to the metric system will mean quite an expense to some. The markings of all scales will have to be changed and the yard stick will go out of existence forever. One writer recently said of the proposed system:

The metric system has been described as "in design the greatest invention of human ingenuity since that of printing." The units of length—the meter—divides by tens (like the dollar) into tenths and hundredths. The "meter" (unit of length) divides into the centimeter and millimeter (like the cents and mills of our coinage). The decimal part of a meter—"decimeter"—is about a "hand" or four inches. The decimeter cube is a unit of volume. That volume of water gives the unit of weight. Six numeral prefixes and five names give all metric tables of weight and measure, which can be formed by any one. Each term is a definition, and the prefix indicates the numerical value. A simpler scheme could not be devised. The essentials of the metric system can be learned in a few minutes. Workmen can take up its use almost without instruction; in fact, in metric countries the people need practically no formal instructions in the system. In contrast with the extreme ease with which the metric system may be learned is the fact that no living American can repeat the tables of weights and measures used in this country.

SMALL MARKET FOR CARRIAGES IN COLOMBIA

In the city of Cartagena, says Consul Ross Hazeltine, there are about 150 public and private vehicles, 90 per cent. of which are victorias. The remainder are of the vis-a-vis type and two-seat carriages. During the fiscal year ended June 30, 1914, about 65 per cent. of the total imports into Colombia came from the United States; England and France furnish the remainder. The import figures were as follows: From United States, \$6,162; England, \$2,655; France, \$1,052; total, \$9,869.

There is no street car system in Cartagena, and few of the streets are paved. Almost all these vehicles were imported through commission houses in this city and in New York City. A few persons own and operate two or three carriages, but there are no wholesale importers. Most of the purchases are made by general importers or commission firms, who order for a coachman. The latter pays for the vehicle on the installment plan.

The chief cause of dissatisfaction has been the excessive weight of the vehicles. Inasmuch as almost all public carriages are drawn by one small horse, the light-weight victoria equipped with rubber tires is preferred. The most popular type of victoria has a small drop seat that can be folded under a cushion drop when not in use.

The import duty on passenger vehicles with springs and with or without rubber tires is \$0.02 per kilo (\$0.009 per pound), gross weight. The retail price for victorias and victoria cabs with double seats facing each other and with rubber tires is \$450 to \$500.

[The names of the leading commission merchants in Cartagena may be obtained from the Bureau of Foreign and Domestic Commerce or its branch offices.]

ATTRACTIVE BOOKLET

One of the latest products of the advertising department of Parry Mfg. Co. is an attractive eight-page booklet published under the caption "Price and Quality." The booklet contains testimonials from Parry dealers, illustrations of their stores, and various selling arguments of the Parry line. Nine different editions have been gotten out, each containing testimonials from a different section of the country. Altogether more than 600 dealers' letters are shown. The accumulative effect of this "stunt" is bound to be good and certainly speaks well for the esteem in which the Parry line is held by dealers, some of whom proudly testify that they have been handling Parry buggies from 25 to 30 years.

LESSONS IN PRACTICAL CARRIAGE DRAWING

By Thomas Mattison, Southampton, England

When a draftsman has learned to put a drawing on the blackboard, full size, he will have traveled a good way on the road that leads to the goal where he can take the shelter of full marks—so far as the effort in using the chalk or lead pencil goes. But there must be practical knowledge to accompany the draftsmanship, and it must be of the first quality, because unworkable draftsmanship is a serious failing, but when they run in double harness smoothly together there is something achieved, something done.

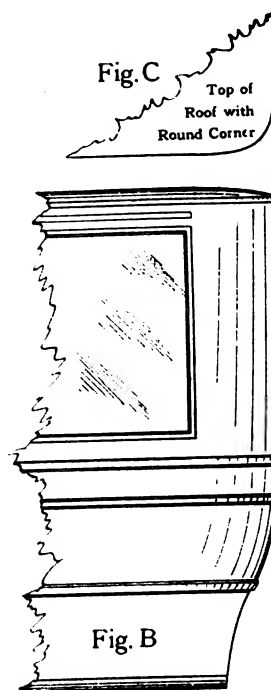
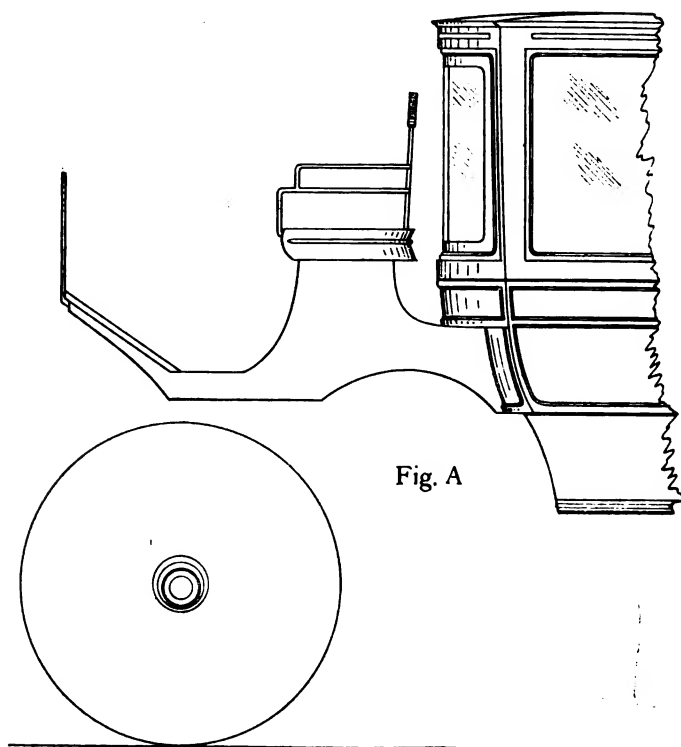
It is not at all a rare thing for those dressed in authority to make drawings that are unworkable, and because they are practically of the abortional type, authority rolls its eyes in puzzled wonder when practice points out the strong weaknesses of authority, and thus through presumptuous incapacity disaster is often wrought, and commercial chaos brought about. We would say to the student avoid being too knowing, for it is a wrong tack—be humble—for talent generally is and can take care of itself when put on its defense.

A drawing may be crude in its outline, but perfectly artistic in its composition. It is proportion in surfacing and the graceful boundary of the lines that give the artistic effect, but grace of outline must be wedded to strength of character, and dignity of poise, to give true expression. These, coupled with good

The diagram lessons, Fig. A, Fig. B, show sections of a bus wagonette body. It is a very good plan for the young draftsman student to practice himself in this. The immediate point in the lessons is to show how to lay elevation sections of a body out, having care to accurately provide for the locking of the wheels under the front of the body, and to design the parts for this purpose with pictorial effect. The lines of the boot also come in for special thought; a boot should be designed to relieve the body, and in every case it should be so fashioned in character with the controlling lines of the body and strengthened to meet its length and surface depths proportionately.

A landau requires a long boot for the front of the head to fall into, and should be so strengthened in the body plating to meet this necessity. The body being long, a long boot harmonizes with it. In a brougham the boot is, of course, much shorter, but space must be very accurately allowed for as well as the locking of the undercarriage and wheels to fully clear the arch panelling, both vertically and horizontally at the center of the wheels in locking.

In a single brougham the boot is kept much shorter than



practical ability to put them into effect, accomplish the desired end of a truly designed carriage.

It is the experience of all men in reading a letter, or in writing one, that actual writing by itself is not of so much account as good spelling and good composition, and above all good expression.

These may convey kindness, sympathy, firmness, or anger, but they are all governed by the parts of speech which grammar demands to give them all a true effect in their correct places, which may be immediate or relative. Now there are many good penmen (draftsmen) but proportionately few good grammarians. But when we have good hand writing (drafting), good spelling, good grammar, and good expression, we read the matter with a joyous relish because the whole thing strikes home and the bullet finds its billet.

in a double body, but the same care and thought must be exercised to preserve harmony and proportion to the main body in both cases.

In Fig. A is shown how to design a boot to a D fronted, or a circular fronted light bus wagonette where the head lifts off or where it is simply a bus.

In making an elevation drawing it is, of course, done in outline, but in a body with rounded corners or where there are parts to be rounded, a knowledge of line shading is necessary to show those parts up more prominently than their mere position shows them to be mechanically. A knowledge of line shading also enables the draftsman to make his drawing more clear to the workman, as well as making the drawing cleaner to work to.

The lesson shows the outline of the body section with cir-

cular front, and the mouldings all defined with the panels set back. The rounding on the body would show themselves if cut in at the points that break away from the straight line. On the mouldings being all drawn out, also the circular front, then the glass frame points can be shown and the circular top rail, and to make it more clear the roof line can be cut back from the corner pillar line as shown in the lesson. Then the rounding lines, all shaded, can be drawn on the front and boot quarter, also on the valance of the boot if the seat is round cornered.

Fig. B shows the back elevation section of the body, with the mouldings and panellings all set out, the top quarter and glass light, ventilation slot, and the round on the roof shown, now with the aid of shading lines, the round corner of the body can be fully conveyed to the workman, and to make this more fully instructive the corner curve of the body is shown from the roof in Fig. C, from which it will be seen with greater clearness how the corner can be shown without the aid of its being projected from the body as in Fig. C.

To the draftsman student these simple lessons will be found to be valuable workshop helps as well as giving a flippant leverage to his efforts.

ONE-MAN, PAY-ENTER MOTOR BUS DESIGN

A special model of chassis and body for passenger service has been brought out by the Great Southern Automobile Co., Birmingham, Ala. This new type of bus is one of the P. A. Y. E. variety, and the illustrations furnish an excellent expo-

sition of the completed car from different points. The bus has a low floor, with a pay-enter door arrangement for one-man operation. It has its motor under a conventional hood with drive by a bottom worm, the latter making the low floor possible with direct mechanical drive.

The chassis is rated at $2\frac{1}{4}$ tons capacity, and the complete vehicle is 22 feet long overall, 7 feet 6 inches wide at the eaves, 8 feet 9 inches high, from the ground to the roof-top, and has 7 inches clearance under the worm.

Twenty-five passengers are carried on a single deck, all of the seats being of the transverse type except at the rear where a rotunda arrangement allows room for the rear wheels. It is expected to have the new buses ready for the market in June.

In detail, the vehicle is built upon a heavy pressed steel drop frame with a 197-inch wheelbase, the front axle being deeply dropped and the rear of the frame having a high arch over the rear axle. Long, half-elliptic springs are fitted both front and rear, both sets underslung. These springs are 3 inches

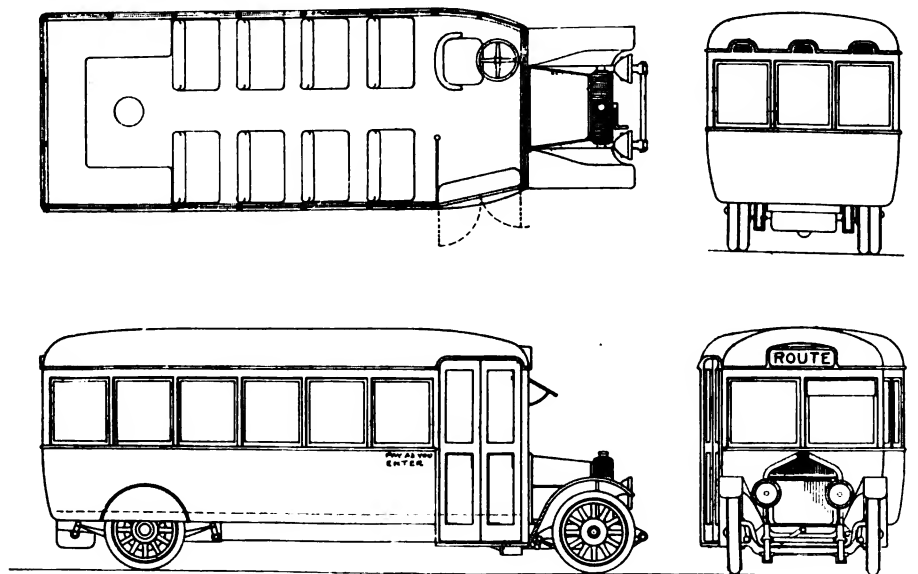
wide, and auxiliary springs to take care of any standing load are also provided. Tread is $65\frac{1}{2}$ inches. The worm gear has a reduction of $7\frac{3}{4}$ to 1.

The $4\frac{1}{8} \times 5\frac{1}{4}$ inch motor forms a unit with the dry-disk clutch and three-speed selective gearset. The motor is cast in block with the valves on the left. It is cooled by a centrifugal pump and a built-up cast-case finned-tube radiator. Dual Bosch ignition with hand spark control is provided and the motor is governed by a motor-driven Pierce governor. This governor is set at 1,057 r.p.m., or 16 miles per hour in high gear.

The door is two-leaf folding, operated by a crank at the driver's hand. When closed it is flush with the side and conceals the steps. The driver's seat is to the left and the body, which is made by the Great Southern Co., is of metal with ash and metal framing, metal panelling, metal roof, wood doors and sash and metal moulding. The seats are of cane. Tires are solid, 36×5 inches in front and 36×4 dual in the rear.

DRESSING TOOLS

I recently overheard a smith say that there was nothing in the dressing of tools for the machine department, as he could make a diamond point lathe tool at one heat. I did not dispute him as I know it can be done, but would prefer a tool that it took more than one heat to make, as in the first place one would have to heat the steel hotter than is good for the steel to be able to get a tool out at one heat. It is my belief to get a good tool it is best to heat moderately and not to use too hard blows with the sledge. If it can not be gotten to



sition of the completed car from different points. The bus has a low floor, with a pay-enter door arrangement for one-man operation. It has its motor under a conventional hood with drive by a bottom worm, the latter making the low floor possible with direct mechanical drive.

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shape at one heat, it is no sin to take one or even more. After forging, heat to an even, dark red and lay one side to cool, then reheat and harden. A tool made up in this way will stand up to its work in good shape. Even in cutting off end I believe it good practice to take an extra heat, as often in cutting, if the tool is a little cool, the edge, instead of cutting clean, will break off, leaving the edge very rough. One may think he is saving time to finish a tool at one heat, but when put to work the man at the lathe has to stop and grind so often that he has lost more time than the smith would have taken to take as many heats as he wishes. So in the long run I believe it pays to go a little slower and get a better article.—H. N. Pope, in *The American Blacksmith*.

Put brains, energy and enthusiasm into your vocation. Go to the bottom of your business if you would climb to the top. Love of your work is the only thing that will carry you through troubles which overwhelm so many who are on the wrong track.

Trade News From Near and Far

BUSINESS CHANGES

G. M. Haring has succeeded Guy Drake in the vehicle and implement business at Francesville, Ind.

The L. P. Warren Vehicle Co., a Little Rock, Ark., concern, filed notice of the surrender of its charter.

Dale & Nelson have sold their vehicle and implement store at Mt. Sterling, Ky., to Eubank & Nelson.

The Boone-Wiseman Co. are going to discontinue their implement and vehicle business at Corydon, Ind.

B. F. & Oscar Kriner have purchased the plant and business of the Browdues Carriage Co., Martinsville, Ind.

Rezabek & Mikulecky have been succeeded in the implement and vehicle business at Wilson, Kas., by S. Mikulecky.

Kipps & Charlton have succeeded to the implement and vehicle business of Fagg, Kipps & Charlton, at Christiansburg, Va.

W. W. Townsend has succeeded to the implement, vehicle and hardware business of Townsend & Miller at Greensburg, Ind.

Charles W. Needles has disposed of his wagon shop at Atlantic, Ia., after having engaged in that business for 30 years. M. P. Brown will hereafter have charge.

Mrs. Oswald A. Claus has purchased a half interest in the implement and vehicle business of F. V. Burkhardt at Woodsfield, O. The firm name will be F. V. Burkhardt & Co.

I. S. Bales, of Knoxville, Tenn., has gone to London, Ky., where he will be associated with T. G. Moren in the sale of International Harvester line of wagons, implements, etc.

Freeman Brothers, of Lebanon, Tenn., dealers in vehicles, implements, hardware, etc., have dissolved partnership. J. E. and I. F. Freeman will hereafter devote their time to the hardware and implement business. H. K. Freeman will handle vehicles, stoves and plumbing supplies.

NEW FIRMS AND INCORPORATIONS

Hobbs & O'Neill will deal in vehicles at Laurel, Ind.

Oscar Peterson will deal in vehicles at Harmony, Minn.

Philip Bane has gone into the vehicle business at Arlington, Ohio.

Hefner & Son have engaged in the implement and vehicle business at Anderson, Ind.

R. Sander and R. Sherwood will open a vehicle and implement store at Grand Rapids, O.

Ray Parker, of Mayfield, Ky., has established a carriage and automobile painting shop on West Broadway.

C. B. Girton & Co. have opened a retail business at Loveland, O., and will handle buggies, automobiles, implements, etc.

The Ashe Supply & Hardware Co. will engage in business at Jefferson, N. C., to handle vehicles, implements and hardware.

The Hardware Store Co., which has been incorporated at Silver City, N. C., will handle vehicles, implements and hardware.

The Hoppe Hardware Co., which has just been incorporated at Apalachicola, Fla., with a capital of \$6,000, will also handle vehicles.

Fisher Vehicle Woodstock and Lumber Co. has been incorporated with a capital of \$5,000 at Erin, Ark., by A. B. Fisher, E. G. Fisher, C. N. Garandol.

The E. A. Cook Wagon Works has been incorporated at

Buffalo, N. Y., with a capital of \$6,000, by Edwin A. Cook, Edwin G. Cook and Harry R. Cook.

The Hendersonville (N. C.) Buggy and Wagon Co., with a paid-in capital of \$5,000 and \$25,000 authorized, has been organized with the following officers: D. S. Pace, president; W. A. Keith, vice-president; Geo. Sloan, secretary and treasurer. The new company will handle buggies, wagons, harness, automobiles, bicycles and general supplies for these vehicles. This company assumes the harness and vehicle portion of the business heretofore conducted by the Farmers' Hardware and Supply Co. and the old Hendersonville Buggy and Wagon Co.

NEWS OF THE TRADE

The Piedmont Wagon Mfg. Co. of Hickory, N. C., closed a large contract recently for wagons, which will take 60 days running full time to fill.

D. T. Reiff is building a two-story brick addition to his carriage working and blacksmith shop at Kokomo. He will use it for his wood working department.

It is reported that the Cruse-Crawford Mfg. Co., Birmingham, Ala., will establish a plant for the manufacture of automobile tops and wagon and buggy bodies.

W. O. Nelson, W. B. Hillman and A. W. Lucas will establish a spoke manufactory at Waverly, Tenn., making a specialty of automobile spokes. They also will put in a planing mill.

The Excelsior Seat Co., of Columbus, announces the opening of a new department for the manufacture of bodies for both motor trucks and pleasure automobiles. The local agency has been placed with the Coates Motor Co., of North Fourth street.

The Schmieder Carriage Co., Chillicothe, O., is erecting a new brick and concrete building to be used as an automobile paint shop and also for heavy horse-drawn vehicles. The building will be steam heated and equipped with all appliances for the economical handling of heavy vehicles of all kinds.

The Hickman Wagon Co.'s plant, of Hickman, Ky., has started up in full operation after being idle for several months. This concern sells a large percentage of its products in southern states. The outlook throughout the south is more favorable and orders already received warranted running the factory full time.

George B. Kunz, receiver for the James & Meyer Carriage and Wagon Mfg. Co., of Lawrenceburg, Ind., has received three large orders for vehicles from England and South Africa. The plant has started operations with an extra force of workmen. All local manufacturing plants are now operating full time with their regular force of employees.

It is reported that the Nyberg automobile plant, at Anderson, Ind., which has been idle for more than a year, has been reopened by a new company. Henry Nyberg, former owner, and W. E. Moore, the former secretary of the plant, are at the head of the new company, with W. A. Gibson, of Indianapolis. It is stated that the company plans to build a light car at a popular price, and that it will adopt a new patent in which Mr. Gibson is said to be interested.

Rehkopf Brothers, carriage manufacturers and repairers, at Topeka, Kas., have purchased property and will erect a three-story building to cost between \$12,000 and \$15,000 on the site. The business of the firm has increased to such an extent that larger quarters are now a necessity. The new building will be 50 x 130 in size and will be of brick, concrete and steel construction. There will be a spacious basement. The structure

will be modern in every respect, being fitted with elevator and many conveniences.

Work was begun on March 20 on a new two-story blacksmith shop for Emil Rothe, at Green Bay, Wis. The first floor and basement will be of reinforced concrete and the sides of red brick. The front will be in red pressed brick. The first floor will be used for general blacksmithing and horseshoeing, while the second floor will be utilized exclusively for wagon making and repairing. An elevator and a system of electric blowers will be installed. When completed, it is claimed, this will be the largest and most modern blacksmith and wagon shop north of Milwaukee.

FIRES

The retail store of George Stacy, of East Townsend, O., was destroyed by fire recently.

The two-story frame carriage factory building of the C. W. Scott Co., Lancaster avenue and Penn street, Bryn Mawr, Pa., was totally destroyed about 5 o'clock on the morning of March 31.

Fire on March 12 destroyed the Smerden buggy factory and repair shop, at Henderson, N. C., a three-story building. A large gasoline tank at the buggy factory exploded and threw flames for many feet in all directions and at one time threatened a great conflagration.

Fire destroyed a portion of the plant of the York Wagon Gear Co., North Belvidere avenue and the Western Maryland Railway, York, Pa., engaged in the manufacture of wagon and automobile bodies, recently, entailing a loss of \$10,000. The fire originated in the drafting room and many valuable patterns were destroyed.

A building occupied jointly by the Versailles Carriage Co. and Luther Wells' general store at Versailles, Ky., was almost completely destroyed by fire during February. The entire stock of the carriage company was removed from the building and was not damaged. The loss to the building and the general store was estimated at \$5,000.

Fire swept through a part of the plant of the Collins Carriage Co., at Camden, N. J., March 27, causing a loss estimated at \$100,000. A large number of automobiles were destroyed. The company opened temporary quarters at 108 Federal street, Camden, on Monday morning, March 29, and work was begun at once cleaning up the refuse and repairing the building, preparatory to an early resumption of business.

EMPLOYEES TAKE OVER MILLER BUGGY CO.

Fred Harberer, Claude Ashlock and Fred Foss, three of the former employees of the Dan Miller Buggy Co., at Alton, Ill., have taken over the business of that company, which they will conduct under the old name. While they plan to engage in the repair business, they also will build buggies to order whenever an order comes in. They will move to their new quarters as soon as the place is finished.

ELECTRIC VEHICLE MILEAGE RUN

The Electric Vehicle Association of America, New York City, reports the record of 14 electric passenger cars, which made a run from Los Angeles to a neighboring town and return, a distance of approximately 100 miles, on a single charge. An electric service truck accompanied the cars and made the same distance on a single charge, with power to spare.

TIRE PLANT FOR MT. CLEMENS

The Auto Tire Armor Co., Mt. Clemens, Mich., has been incorporated with \$10,000 capital stock to manufacture automobile tires. A factory has been purchased and equipment will be installed at once. Jay Baldwin and A. A. Bennett are the principal stockholders.

EMPLOYER MAY DISCHARGE WORKMAN FOR BELONGING TO A UNION

A press dispatch from Washington, D. C., states that an employer may refuse to employ and may discharge a man for belonging to a union, according to the decision of the Supreme Court, handed down recently. The Kansas coercion statute, so called, making it unlawful for any individual or corporation to coerce or influence any person to enter into an agreement not to join or remain a member of labor organization as a condition of such person securing or continuing in the employment of such individual or corporation, was annulled as unconstitutional by the Supreme Court.

The decision, which is regarded as of the first importance in the labor world, was announced by Justice Pitney. The case was that of T. B. Coopage, a superintendent of the St. Louis and San Francisco Railway at Scott, Kan., convicted of violating the law in threatening A. R. Hodge, a switchman, with discharge if he did not sign an agreement to withdraw from the Switchmen's Union.

The other laws which, according to Justice Day, are invalidated by the decision, are those of California, Connecticut, Colorado, Indiana, Massachusetts, Minnesota, New Hampshire, New Jersey, New York, Oklahoma, Oregon, Pennsylvania, Wisconsin and Porto Rico.

TEAM OWNERS CHANGE NAME TO INCLUDE MOTORS

Following the example of the Kansas City Team and Motor Truck Owners' Association, the Allegheny County Team Owners' Association, at a meeting in Pittsburgh on March 18 appointed a committee to provide for the revision of its charter and a change in name to the Allegheny County Team and Motor Truck Owners' Association. At the time of the meeting there were many bills up in the Legislature at Harrisburg, which affected the welfare of the team owners. These were discussed at length and action taken upon them. The bill to provide that all vehicles in the state of Pennsylvania should carry lights after dark has since been defeated. A bill to reinstate the old toll rulings on the numerous bridges of Pittsburgh was reported beaten. The condition of the streets was referred to the legislative committee with power to take this up with the proper authorities. At the present time, Pittsburgh streets are in very bad condition.

POSTAL RATE REDUCTION

The United States is negotiating with all the nations in the western hemisphere to reduce the postal rate to two cents. The rate to the British Colonies of Barbadoes, the Leeward Islands, including Antigua, Barbuda, St. Kitts, Dominica and Montserrat, and to the Virgin Islands has been reduced from five cents to two cents an ounce.

MOON MAKES FACTORY CHANGES

Many factory changes have been made by the Moon Motor Car Co., St. Louis, Mo., because of the increase of business. The company has had new switches laid connecting its yards with the tracks of two railroads and has enlarged its enameling ovens. Hereafter an entire floor will be devoted exclusively to painting and varnishing.

DECLARES TEN PER CENT. DIVIDEND

The Mansfield Tire & Rubber Co., of Mansfield, Ohio, at its annual meeting on January 19, declared a 10 per cent. dividend and elected the following officers: President, Judge C. R. Grant, of Akron; vice-president and general manager, G. W. Henne; secretary, J. E. LaDow; treasurer, W. F. Henne, of Piqua, O.

OBITUARY

J. W. Anderson, who was more than 90 years old, and who had been manager of the Studebaker Wagon Works, of Moline, Ill., for many years, died in that city, March 8, after a long illness caused by advanced age. Mr. Anderson lived for a time in Detroit and South Bend; however, he has been a resident of Moline for the past half century, spending his time and energy in building up the Studebaker works. He is survived by his wife and son.

Philo G. Belnap, 87, for more than 50 years a well known wagon manufacturer and blacksmith of Detroit, Mich., died March 28 from uraemic poisoning. Mr. Belnap was born in Oneida county, N. Y., in 1827, and moved to Detroit when 20 years old. For a time he was employed in various blacksmith shops, until he began the manufacture of wagons in a shop at Jefferson avenue and Twelfth street. Later the business was moved to Twelfth and Fort streets, where it was continued until Mr. Belnap's retirement, about 15 years ago. He is survived by his widow.

Frederick A. Goetz, for many years foreman of the body department of Brewster & Co., New York City, died recently. Mr. Goetz was born in Wuerttemberg, Germany, learning the trade of carriage building in his father's shop in that city. In 1863, he went to Vienna, Austria, and from there to Munich, Bavaria, and then to Paris, France, working in the best shops in these cities. In Paris he also attended the lectures given by Henry Zablott, a world-famous expert in carriage body building. Returning to Germany, he became a designer in the carriage establishment of Mengelbier, Duesseldorf. After a short stay he came to New York, where he entered the employ of Brewster & Co., Broome street, as body maker. While with this house he won a silver medal for vehicle design at the Paris Exposition of 1878. Upon the retirement of John Gribbon, Mr. Goetz was selected as foreman of the body shop, where he remained until March, 1897, when he retired from active work. Subsequently, tiring of inactivity, he engaged with Rothschild & Co., who were building fine automobiles, but when this firm relinquished the business Mr. Goetz retired permanently.

Alexander Hand, 74, of Salem, N. J., died March 24. The deceased had been an invalid for several years, ever since he dislocated his hip in an accident, but was able to get about his home city in a wheel chair, whenever the weather would permit. Mr. Hand was born in Salem, N. J. He became associated with his father in a wheelwright and carriage making business when a young man, and in 1869 was admitted to partnership with his father. He continued the business after the death of his father, and enjoyed an extensive patronage. He leaves his widow and three children.

James A. Gray, for many years a vehicle dealer in Des Moines, died recently at his home in Miles, Ia. Up to two years ago he was a member of the implement and vehicle firm of Sims & Gray. His widow survives.

John Frederick Luhrs, 74, president of the Koenig & Luhrs Wagon Co., Quincy, Ill., died March 26, after suffering two years from stomach trouble. Mr. Luhrs was born at Loxstedt, near Gestemunde, Germany, coming to this country when he was 17 years old. He engaged in the wagon making business in Quincy in the early 70's, but in 1881 he severed all other connections and formed a partnership with Joseph Koenig, under the firm name of Koenig & Luhrs Wagon Co. Mr. Koenig had organized the company in 1866 and had developed a substantial business. Its marked development, however, dates back to the time of its reorganization. Under the combined efforts of Mr. Koenig and Mr. Luhrs, the concern grew into prominence. In 1901 Mr. Koenig died and then Mr. Luhrs was elected president, which office he held up to the time of his

death. For the past ten years he had retired from the active management of the business, but during these years he took a deep interest in the affairs of the concern and had traveled extensively in the interests of the firm. His widow survives him, as do also three children by his first marriage.

Thomas J. McNamara, Sr., 85 years old, pioneer carriage manufacturer, died March 25, at his home on Price Hill, Cincinnati, following an illness of infirmities incident to old age. Mr. McNamara moved to Cincinnati from Limerick, Ireland, 64 years ago. He was connected with the Phoenix Carriage Co. for 25 years as treasurer of the firm. His son, Thomas J. McNamara, Jr., is president of the concern. Before entering the carriage business the elder McNamara was a tea merchant. Besides his son Thomas he is survived by a daughter and another son Michael J. McNamara, who is connected with the Cincinnati Panel Co.

Maurice Murphy, a pioneer wagon maker of Walla Walla, Wash., aged 80, died March 12, after a long illness. He lived in Walla Walla over 40 years, being one of the first wagon makers to settle here. Two sons survive.

August Sust, retired wagon maker of Wausau, Wis., died March 9, after four months' illness. Mr. Sust was born July 24, 1830, in Germany. He was married in 1872 in Milwaukee and is survived by his widow and one son. Mr. Sust had been a resident of Wausau since 1866.

Edward W. Thiele, for 20 years a partner in the firm of Wertz & Thiele, wagon and carriage manufacturers at 1238 South Ashland avenue, Chicago, Ill., died at his residence, 1404 Independence boulevard, on March 11. He is survived by his widow and four children.

BACK TO HIS OLD LOVE

William J. Slater has resigned his position as assistant sales and advertising manager of the motor car department Durant-Dort Carriage Co., Flint, Mich., to join the sales organization of the Firestone Tire and Rubber Co., Akron, O. Mr. Slater was at one time advertising manager of the Firestone Tire and Rubber Co.

HOUK BUYS AMERICAN SPOKE CO. PLANT

George W. Houk has purchased the plant of the American Spoke & Nipple Co., Detroit, Mich., for the Houk Mfg. Co., and will move all the machinery to the Buffalo plant. It has a capacity of 25,000 spokes and nipples per day. At the present time the Houk company is using 30,000 per day.

CLOTHING THE SOLDIER

This war is using up a soldier's uniform in a month. The British, indeed, for sanitary reasons burn a uniform after a month's wear. Can the armies continue to be clothed in wool? The sheep of the world are not enough by 400,000,000. Hence the expectations of the champions of cotton over the clothing of 10,000,000 fighting men.

START WORK ON GRANT PLANT

The Grant Motor Co., Findlay, O., has already commenced using the auxiliary plant in South Findlay that it recently leased. The chassis will be built in the North Findlay plant and the cars completed at the South Side plant.

PUBLIC DEBT TOTALS

The national debt in 1913, according to the Federal Census Bureau, was \$1,028,564,055; the debts of the states amounted to \$354,942,805, and the debts of counties, cities and other minor civil divisions reached a total of \$3,475,954,353.

"GOOD ROADS DAY" IN PENNSYLVANIA

It is estimated that more than half a million men will work on the highways of Pennsylvania on May 26, which is designated "Good Roads Day." An organization of 20,000 in Blair county is already enlisted. All the motor organizations and civic clubs are co-operating with the county commissioners. Automobiles will carry the workmen to all parts of the county and back to their homes at the end of the day's work. Similar organizations have been formed in all of the 67 counties in the state and for one day at least the state roads will get plenty of attention.

NEW POLE AND SHAFT COMPANY

The Brighton Pole & Shaft Supply Co. has been organized at Cincinnati, O., for the manufacture of the lines indicated by its name. The company will have its own bending plant and its own iron plant. A large stock of strictly first class materials has been procured. It is expected this organization will be in position to furnish high grade goods at the lowest prices. The company is entirely independent of any other concern engaged in this line.

REPUBLIC TRUCK CO. TO ENLARGE

The business of the Republic Motor Truck Co., Alma, Mich., is keeping on increasing in such a way that the enlargement of the plant will most likely be necessary within a short time. During the week ending March 6 a total of 42 orders for trucks were received and during the week ending March 13 30 trucks were built and shipped. This month's business, it is estimated will total more than \$150,000.

TROY WAGON WORKS TO BE ENLARGED

The Troy Wagon Works Co., Troy, Ohio, has started building a new motor truck trailer works, which will cover 16,800 square feet of ground, being 120 by 140 feet in size. The company will turn out more than sixty trailers a week. The company is now making trailers in three sizes—1½-ton, 2½-ton and 5-ton. The 1½-ton is non-reversible, while the other two may be obtained in either reversible or non-reversible types.

HOWARD BARCUS NOW REPRESENTS FISK RUBBER CO.

W. Howard Barcus, for the past 14 years traveling representative of the Carriage Monthly, first in the eastern states and later in Ohio, Indiana and Kentucky, has given up his work with that publication and become branch manager for the Fisk Rubber Co., of Chicopee Falls, Mass. He will have charge of Fisk tire sales in the state of Ohio, with headquarters at Cleveland.

HORSE-DRAWN VEHICLE NOT PASSING

A letter recently received from the Rubber & Celluloid Harness Trimming Co., of Newark, N. J., contains this paragraph: "The idea put forward by motor car promoters that the horse-drawn pleasure vehicle is passing is disproven by the experience of makers of hard rubber trimmings, their output for last year comparing favorably with former years in volume with good prospects for its continuance."

HUPP PUTTING UP ADDITIONS

The Hupp Motor Car Co., Detroit, Mich., is spending \$150,000 for additions to its plant, including a two-story office building, 1800 x 300 feet; a top and body building, 1500 x 300 feet; a testing laboratory, 350 x 200 feet, and an engineering building, 200 x 200 feet.

WANTS

Help and situation wanted advertisements, 1 cent a word; all other advertisements in this department, 5 cents a word; initials and figures count as words. Minimum price, 30 cents for each advertisement.

PATENTS

Patents—H. W. T. Jenner, patent attorney and mechanical expert, 606 F St., Washington, D. C. Established 1883. I make a free examination and report if a patent can be had and exactly what it will cost. Send for circular.

FOR SALE

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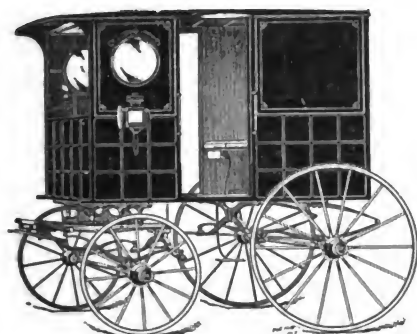
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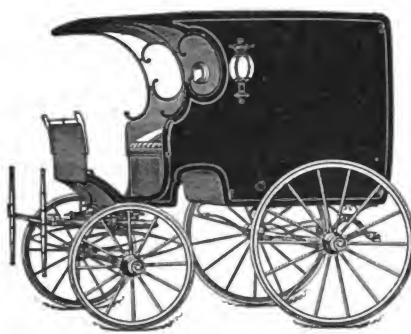
Figures sent out by the Firestone Tire & Rubber Co., of Akron, O., show a 78 per cent. increase in output for 1914 and an increase of 50 per cent. in number of dealers handling the Firestone tire.

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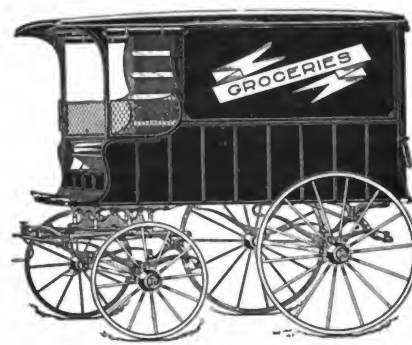
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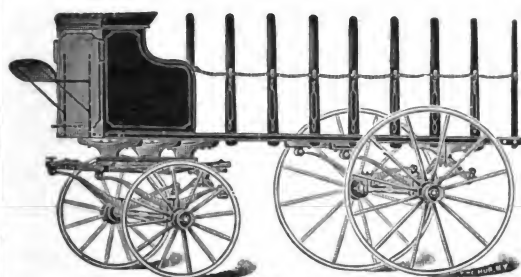
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No. 111.—Altman Wagon.



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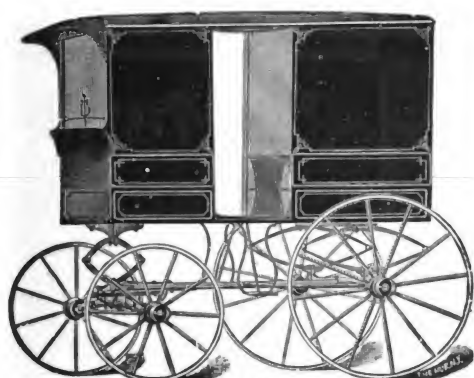
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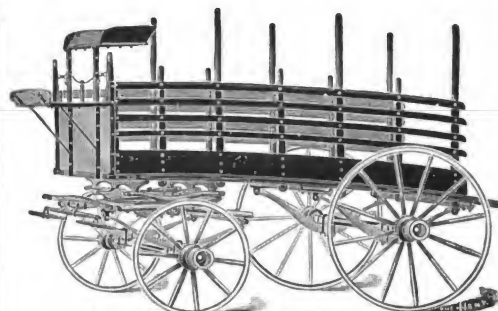
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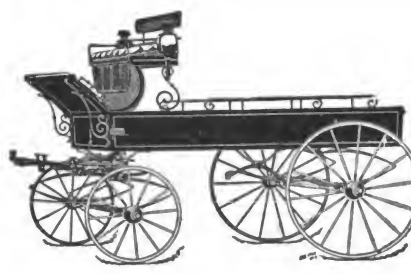
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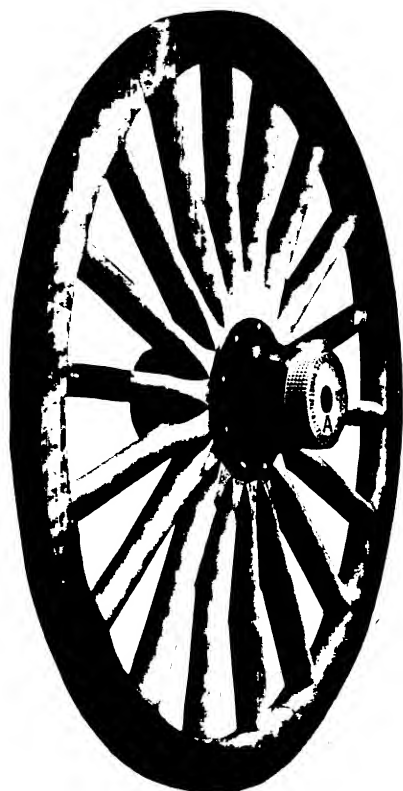
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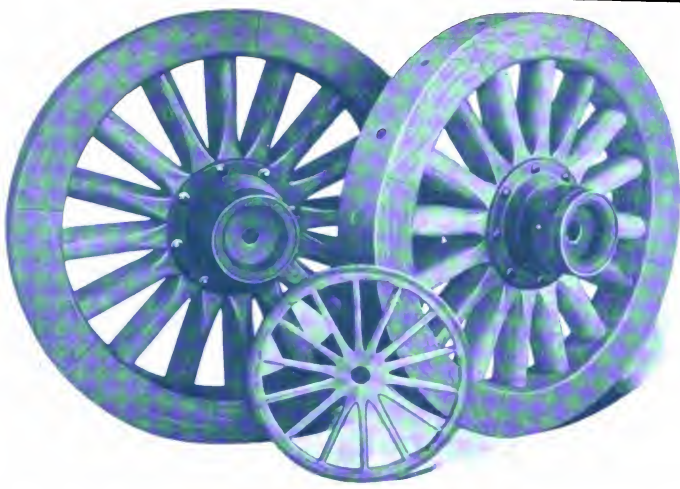
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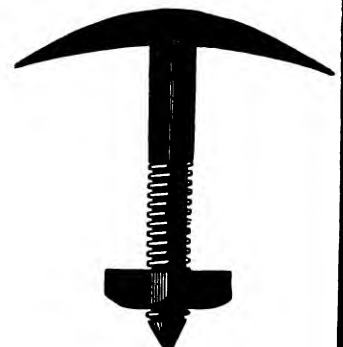
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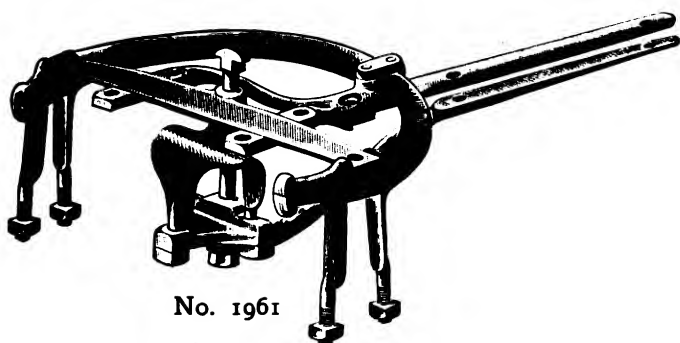
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An extra painstaking revision of the names (and other information as below) constituting the Retail Harness Trade, has been completed for this year's issue of the Directory, and we think the work is so important and worthy that the

1914 Price Is \$5 Per Copy

and it is very moderate for what is offered in a work that is

Indispensable for Reference

for copying of addresses, and for all purposes usual in a directory.

Just a Sketch of Its Contents

The list of the **WHOLESALE** and **JOBGING TRADE** is so arranged as to make it convenient to separate the association members from those not so recognized.

The **RETAIL HARNESS MAKERS** of the United States and Canada comprise the principal part of the Directory, arranged by State, Town and County, and in the large cities, the street and number is given. Those rating (approximately) over \$1,000 are marked.

A list of **HARNESS DEALERS** as distinguished from retail harness manufacturers, is also given. The value of this list to those who solicit the vehicle, implement, hardware and department stores will be readily appreciated.

A list is also published of Export Commission Merchants, giving the class of merchandise they handle.

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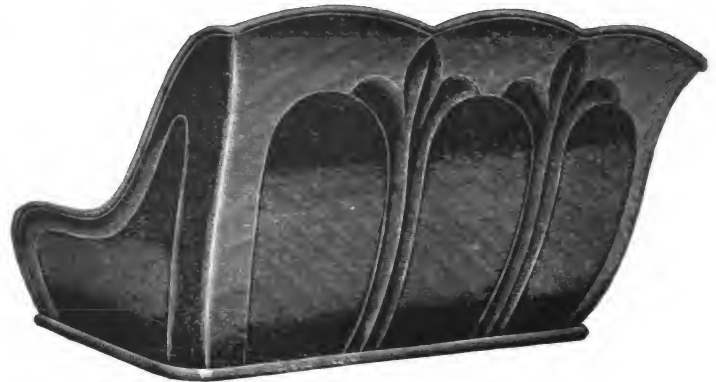
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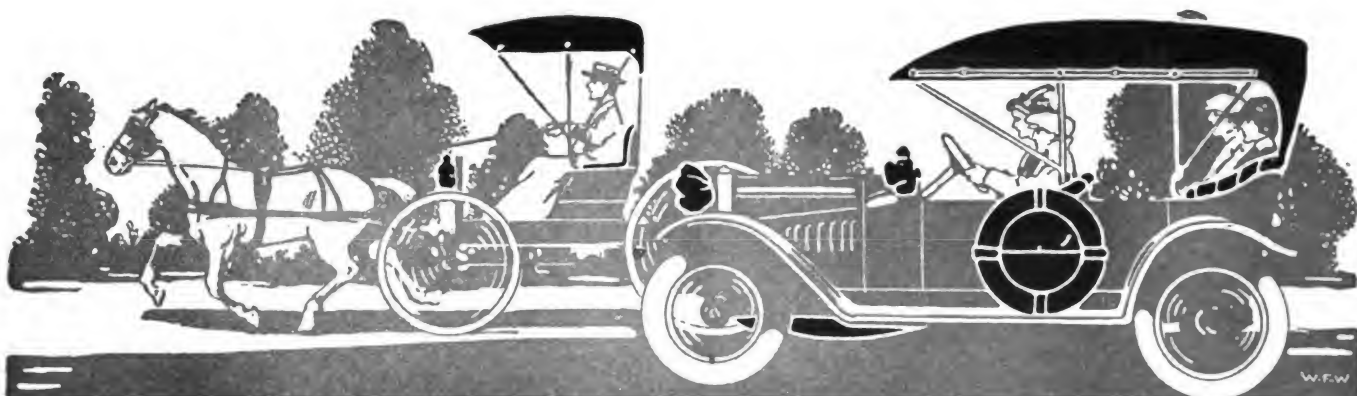
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Vol. LVII

MAY, 1915

No. 2

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Publishers of THE HUB

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THE HUB is published monthly in the interest of employers and workmen connected with the manufacture of Carriages, Wagons, Sleighs, Automobiles and the Accessory trades, and also in the interest of Dealers.

Subscription price for the United States, Mexico, Cuba, Porto Rico, Guam the Philippines, and the Hawaiian Islands, \$2.00, Canada, \$2.50, payable strictly in advance. Single copies, 25 cents. Remittances at risk of subscriber, unless by registered letter, or by draft, check, express or post-office order, payable to the order of THE TRADE NEWS PUBLISHING CO.

For advertising rates, apply to the Publishers. Advertisements must be acceptable in every respect. Copy for new advertisements must be received by the 25th of the preceding month, and requests to alter or discontinue advertisements must be received before the 12th day of the preceding month to insure attention in the following number. All communications must be accompanied by the full name and address of writer.

FOREIGN REPRESENTATIVES:

FRANCE—L. Dupont, publisher of *Le Guide des Carrossiers*, 78 Rue Boissiere, Paris. Subscription price, 15 francs, postpaid.

GERMANY—Gustave Miesen, Bohn a Rh. Subscription price, 12 marks, postpaid.

ENGLAND—Thomas Mattison, "Floriana," Hillside avenue, Bitterne Park Southampton. Subscription price, 12 shillings, postpaid.

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Fate of the Jitney

The Oakland Chamber of Commerce, Oakland, Cal., has recently made public an exhaustive report, compiled by a special committee of the chamber, after an investigation of the jitney movement in all the principal cities of the country.

From the standpoint of those more or less directly interested in the development of the jitney bus, there is much of more than passing interest in the report. After pointing out the justification for the various improved transit units, which have each superseded a method considered quite efficient at its initiation, the committee asks: "Is the jitney to supersede the trolley car? Will it result in still further increasing traffic range and the economic residence limit from the business centers, or if not extending these limits will it add to the speed, comfort or safety of the service within the present limits?"

A summing up of the matter presented leads one to the conclusion that the jitney of the future, the efficient, economical jitney, will be of the omnibus type of design.

A careful study of the working of the jitney systems

now existing will, no doubt, furnish endorsement for such a conclusion.

The point of particular interest to the trade, perhaps, is that there are opened up possibilities in the way of design and manufacture of bus bodies, that should furnish an increase of business for those who may evolve the most efficient and economical type of construction. The matter will bear careful consideration in any event.

Our Southern Trade Relations

Men of influence and standing from the Latin-American republics at the Financial Congress, held in Washington, D. C., May 24, represented nearly every nation of Central and South America. The Merchants' Association of New York says:

"Events have brought about a relationship between the nations of the western world which has never before existed. The Latin-American republics, at peace with one another, are turning to the United States in a spirit of friendly confidence, seeking its aid in the development of their commerce and their enormous resources. It largely depends upon the attitude of this country whether this feeling shall be transitory or become firmly established."

Scientific Design

The paper by A. P. Brush, presented to the S. A. E. at Detroit and printed elsewhere in this issue of *The Hub*, furnishes interesting and valuable information for chassis designers. Particular attention is called by Mr. Brush to the elimination of unnecessary weight in the design of chassis illustrated.

It is an admitted fact that modern improvements have to a considerable extent developed an increase in weight of up-to-date chassis and it will be of instructive value to observe how the method of construction as illustrated by Mr. Brush handles the problem of maintaining sufficient strength and at the same time producing an efficient construction design free from useless or unnecessary material and weight.

The opportunity for further development along similar lines is full of possibilities and much will undoubtedly be accomplished in the present decade.

Statistics show that about one million sets of wheels, axles, shafts, etc., were supplied in the last year by manufacturers to those engaged in the vehicle making business. Looks like there were still enough carriages

and wagons being sold to keep the wheels of the industry turning, even if Mr. Ford is turning out two thousand automobiles per day.

THE JITNEY FROM THE COMMUNITY STAND-POINT

Report of Transportation Committee of Oakland Chamber of Commerce

"The jitney from the community standpoint"; its origin and reason for being; how it operates; present effect; probable future; and a complete survey of the community's interest in this new transportation scheme, is covered by an exhaustive report of a special transportation committee which has just been approved by the board of directors of the Oakland Chamber of Commerce and Commercial Club Consolidated. This committee, of which Stephen E. Kieffer, consulting engineer, is chairman, and of which the other members are J. H. L'Hommiedieu, landscape engineer, and M. R. Sherwood, manager of the Sunset Lumber Co., made inquiries and an investigation throughout all the principal cities in the United States. The report is based upon that investigation.

The investigation was undertaken because it was believed that the dominant party at interest in any change of transportation units is the community, and that is covered by the opening paragraphs in which the committee says: "In all of the controversies and hearings over the jitney bus problem thus far, in the press and before legislative bodies, the positions taken and the views expressed have very naturally been those of the interested parties from their immediate viewpoint—on the part of the street railways to protect their income and investment; on the part of the jitney owners to establish a business; and on the part of the traveling public to consult only its own temporary fancy, prejudice or convenience."

In another paragraph the committee asks: "Have we now reached the point where the electric trolley car is to be rendered obsolete and be superseded by the independently owned and operated small transportation unit traveling on 'rubber and air' and propelled by its own power plant? Is this a scientific advance in urban transportation, and an economic necessity demanded by the people? Will it result in still further increasing traffic range and the economic residence limit from the business centers, or if not extending these limits will it add to the speed, comfort or safety of the service within the present limits?"

The History of Transportation

The committee calls attention to the fact that in looking over the history of urban transportation we find the horse car giving way to the cable car, and the cable car (except under very special conditions) to the electric trolley car. There was an economic justification for each change which made it necessary and unavoidable. The wiping out of investments in the horse car, cable car, and earlier electric car lines and equipment, and replacement with the efficient and expensive modern equipment, had its justification in the accompanying social, physical and financial development and improvement of the people and communities affected. It was reflected in an increase in property values which greatly overshadowed the immediate investment in the transportation system destroyed.

Will the jitney do this?

It is quite conclusive that if the motor bus comes to stay, it will not be in the shape of the present jitney, and if the motor bus is to be the transportation unit of the future, it will supersede the electric car because it is economically right, and in doing so, it would justify the replacement of the present investments by enhancing the property values of the community.

This is the key note from the standpoint of the report. Will the jitney relieve congestion in apartment or tenement sections in the way that every city in America is striving to solve that

problem, or will it only aggravate and increase the present difficulties? If it does not, what will become of the values beyond the 2½ mile limit which the committee finds to be the ultimate range of service of the jitneys? If the jitney weakens the present transportation systems which draw the support for unprofitable lines serving the outlying districts from the section where traffic is densest, what does it mean to the property owner and the home owner in the suburbs of Oakland, and the American city?

The committee believes that the jitney bus in a large measure is due to poor business, hard times, and the impossibility of men obtaining work of any kind. "Many of these men already owned small autos, or had saved enough money to buy an automobile, and in this way they went into the jitney bus business. . . . For the present they are doing something for themselves and their families, their time is occupied and the nickels they take in enable them to eat at the expense of their autobus. In other words, the jitney driver is living upon his capital, or the capital of some one else, because the income is not sufficient to provide for his living and the necessary operating expenses, plus fixed charges and depreciation."

The Cost of Operation and Effect Upon Securities

Extended investigations of the committee showed them that the average jitney travels 137 miles per day with a car mile income of 5½ cents. Considering depreciation and cost of operation and allowing \$3 to the driver, it was found that even the smallest jitney could not run for less than 7 cents per mile. This emphasizes the fact that most drivers are living at the expense of their auto bus and on their capital rather than on their income.

Investigation of certain standard traction bonds in California with a par value of \$107,422,000 showed a shrinkage from December, 1914, to March, 1915, of \$8,887,000 or about 8¼ per cent.

The ultimate effect of this is appreciated by anyone who considers that over \$60,000,000 worth of California electric railway bonds are held by savings banks and local investors in California, or, in other words, by home people. \$430,757,705 in outstanding stocks and bonds was the total for 30 street railroads on June 30, 1913.

The state receives 5¼ per cent. of the gross income of street railways, and the total tax paid on gross income amounts to about 12 per cent. This means a total loss to the public on principal lines of the state \$300,000 per annum, aside from the other form of taxation placed by the public upon street railways in the building and maintenance of that portion of the street occupied by the roadbed.

Effect Upon Streets

It was found that in London where the motor bus has attained its greatest prominence, the fact was brought out in a hearing before Parliament that whereas the cost of maintaining a certain road surface prior to the advent of the motor bus was 6.483d per square yard, it was increased to 13.403d after one year of bus traffic, or slightly over 100 per cent. In this case it was the public—or in other words, the Middlesex County Council—appearing in its own behalf to demand relief from a new burden of taxes imposed by the bus traffic.

During the rush hour from 5 to 6 p. m., the average number of passengers transported in the 5-cent limit from the business center of Oakland (a length of three blocks on Broadway) is 11,000. Approximately 13 jitneys would be required to give the same carrying capacity as one street car. In Oakland, to handle the above traffic requires 234 cars with a headway of 15 seconds. To move the same traffic with jitneys at 13 to 1 would require 3,000 cars.

No further argument need be advanced as to the necessity for fewer and larger transportation units in the congested districts during rush hours or normal hours of large traffic.

The logical conclusion from the committee's report is that if the public continues to support the jitney, and thereby weakens the street railways and ultimately put them out of busi-

ness, they must expect a zone system of fares, because the small jitney cannot operate over a much longer route than three miles at a profit. The American cities have religiously fought the zone system on account of the destruction of property values and the congestion of population.

TRUCK MAKERS MEET AT DETROIT

Delegates Indorse Plan for Better Understanding Among Manufacturers

Strong endorsement of plans that will lead to a better understanding among manufacturers and a greater degree of standardization in the making and marketing of power-driven trucks was given by the 25 or more delegates to the motor truck convention of the National Automobile Chamber of Commerce, which held a two-day session in the Hotel Statler, Detroit, May 5-6.

It was decided to meet again in the fall, when reports on the result of co-operative plans adopted will be made and new problems presented.

More real business was transacted than at any previous meeting of the truck men, and a great deal was accomplished to weed out the undesirable features of the industry as it is today.

A committee of five non-members of the N. A. C. C. was appointed to work in conjunction with the commercial vehicle committee of that body to decide upon a form of service policy to do away with the indefinite and expensive service methods now practiced by the makers and their dealers.

The service policy subject was opened by Alvan Macauley, general manager of the Packard Co., who read a paper entitled: "Can Manufacturers Have a Standard Service Policy?" W. L. Day, of General Motors Truck Co., is of the opinion that no free service policy is required. His company has cut out entirely what is known as free service.

Following the reading of Mr. Macauley's paper a committee of ten was appointed to prepare a form of service policy to be recommended for adoption by commercial vehicle makers as being fair to truck users and not too burdensome on maker or dealer.

The paper of Robert O. Patten, of the Pierce-Arrow Motor Car Co., on the opportunities for the dealer to make money in the truck business, elicited the general opinion that conducted on even moderately efficient plans, the selling of trucks with its unlimited future, because of their speed and economy for transporting necessities, offers a profitable field.

Interesting facts of the methods that obtain in granting credits in truck selling were disclosed by Windsor T. White, president of the White Co., in his paper on the "Advantages of Time Payments Sales of Motor Trucks and How They Should Be Handled."

The bad results that come from selling trucks to those who cannot use them to a profit were clearly shown in the paper, "Why Service Conditions Should Be Investigated and Recommendations Made Before Selling," by Vernon Munroe, president of the International Motor Co.

The members of the convention apparently had the matter of the N. A. C. C. standard 90-day warranty all thought out beforehand, for it was approved without much discussion as being the most advisable way to handle the question of replacements. This warranty is now in use by a large number of manufacturers and is proving satisfactory. It is fair because any defective materials or workmanship should develop in three months of reasonable service. It gives a good basis of adjustment, and now a concern would really be foolish not to work under its provisions.

Following M. L. Pulcher's paper on motor truck shows, the delegates voted that for this year, at least, not enough advantage could be derived from such exhibitions, although they conceded they had been of tremendous benefit to the passenger car manufacturer. There were some who favored a show,

with contests and demonstrations on some big course like the new Sheepshead Bay speedway.

A technical paper was read by F. W. Davis, of the Pierce-Arrow Motor Car Co., entitled, "Can a Standard Load Rating Be Devised and Approved by the Manufacturers?" and indorsed in the affirmative by the convention. C. W. Squires, Jr., of the General Vehicle Co., in his paper on "The Future of the Electric Truck," indicated the progress of that type of vehicle.

One of the most interesting topics was the opinion on "The Clayton Act and Powers of the Federal Trade Commission," prepared by Charles Thaddeus Terry, general counsel of the National Automobile Chamber of Commerce.

The offering of E. S. Foljambe, of the Commercial Car Journal, was on "Limitation of Weight, Size and Speed of Motor Trucks," following which the convention closed with a vote of thanks to the commercial vehicle committee and its chairman, Windsor T. White, who presided.

PROTEST FROM CARRIAGE BUILDERS

Complaint against a large number of railroads was filed with the Interstate Commerce Commission at Washington, May 10, by the American Carriage Co., the Anchor Buggy Co., and the Brown Carriage Co., all of Cincinnati; Delker Bros. Buggy Co., of Henderson, Ky.; F. A. Ames Co., of Owensboro, Ky.; the George Delker Co., of Henderson, Ky.; T. T. Haydock Carriage Co., of Cincinnati; Hercules Buggy Co., of Evansville, Ind.; Hickory Carriage Co., of Cincinnati; Luth Carriage Co., of Cincinnati; Parry Mfg. Co., of Indianapolis, Ind.; Rex Buggy Co., of Connersville, Ind.; the Sayres & Scoville Co., of Cincinnati; Sechler & Co., of Cincinnati; Seidel Buggy Co., of Richmond, Ind.; Union City Carriage Mfg. Co., of Union City, Ind., and other concerns engaged in the manufacture of buggies and carriages.

The defendants are practically all the railroads in the United States operating between Cincinnati and the Pacific coast. The complainants object to the separate and different tariff rates maintained in southwestern territory on "vehicles," and on "spring vehicles," declaring that this classification is arbitrary, unwarranted and ambiguous. The complaint asserts that it is "a physical impossibility for the shippers of vehicles of the type and character manufactured and shipped by complainants to load cars less than 50 feet in length to the minimum required by said tariffs, that the maintenance of 20,000 pounds for cars of any length is arbitrary, unjust and unreasonable and unduly discriminatory in favor of the shippers of agricultural implements and vehicles mixed."

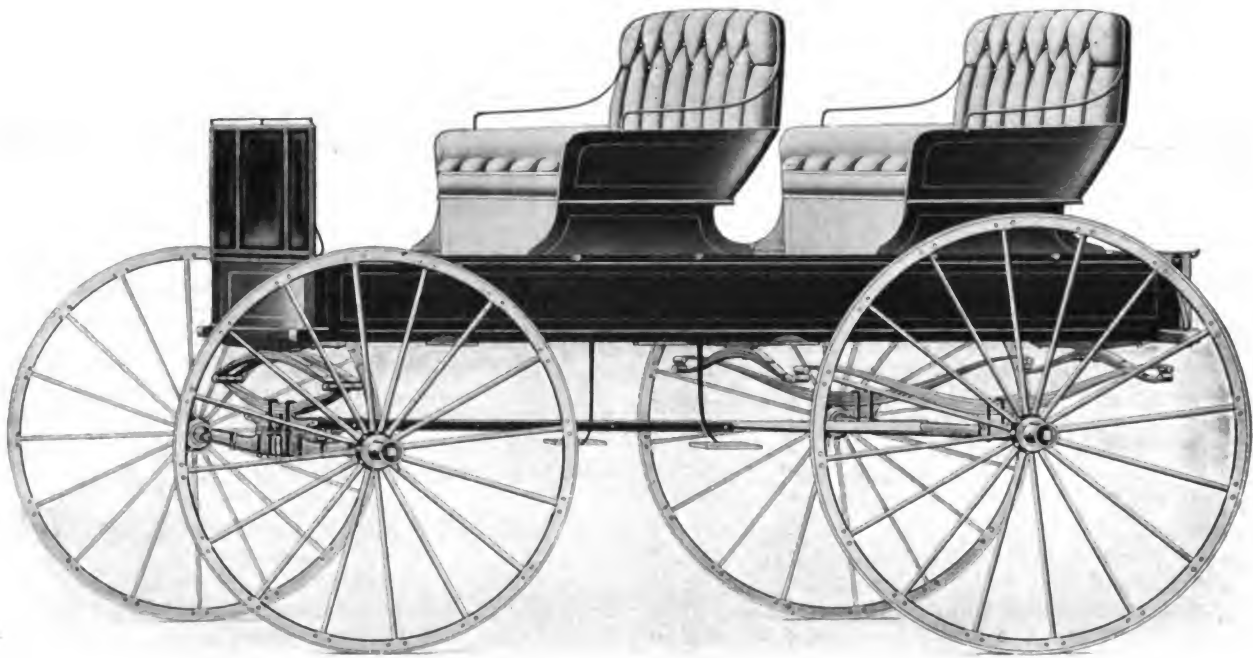
The complainants ask the commission to adopt the following minimum weights: 36-foot cars, 10,000 pounds; 40-foot cars, 12,000 pounds; 40-foot cars, 9 feet 3 inches high or higher, 14,000 pounds; 45-foot cars, 16,000 pounds; 50-foot cars, 18,000 pounds.

TIMKEN-DETROIT PLANTS TO BE GREATLY ENLARGED

Ground is about to be broken for a new forge shop and power plant for the Timken-Detroit Axle Co. This will double the present capacity of the concern for drop forgings, etc.

The site of the new buildings is approximately 1,000 feet long, facing the present plants and on the opposite side of the street, while it is about 500 feet deep, and it is probable that the entire space will be filled with the buildings.

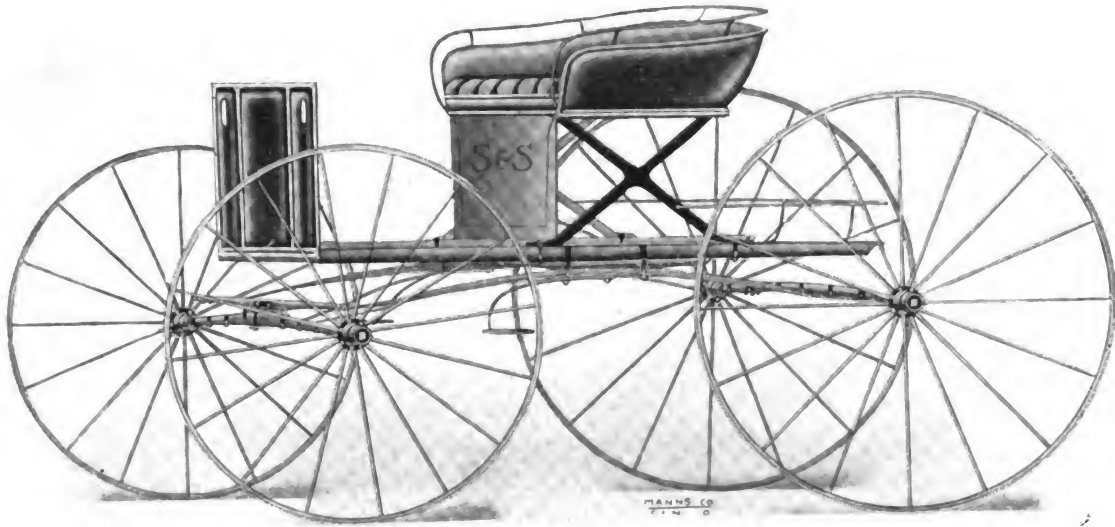
Timken-David Brown facilities are also to be increased to about double their present capacity on worm gear making when a building now under way and three stories in height of brick is completed. This was begun earlier and is in addition to the expansion already mentioned. The axle output is about 250 sets of standard Timken front and rear axles a day, and 50 sets of the Timken-David Brown worm type. The additions now under consideration involve \$750,000.

**HEAVY PLATFORM CLIPPER WAGON**

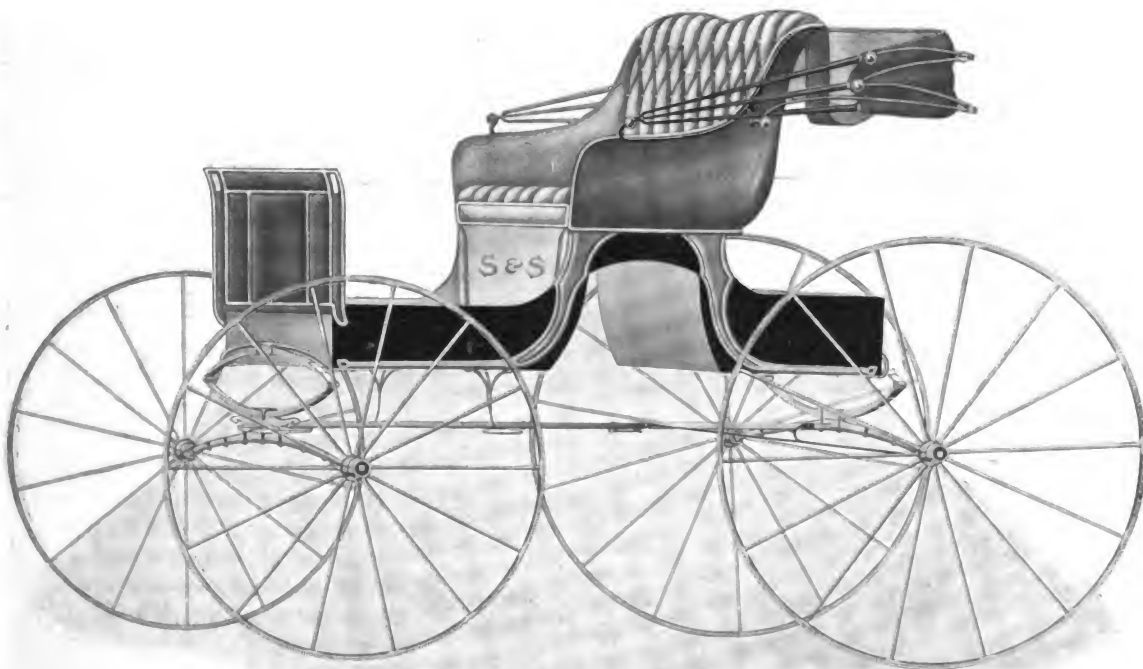
Made by
STAVEL CARRIAGE CO.,
 Chicago, Ill.

**No. 521 HEAVY CONCORD, CORNING BODY**

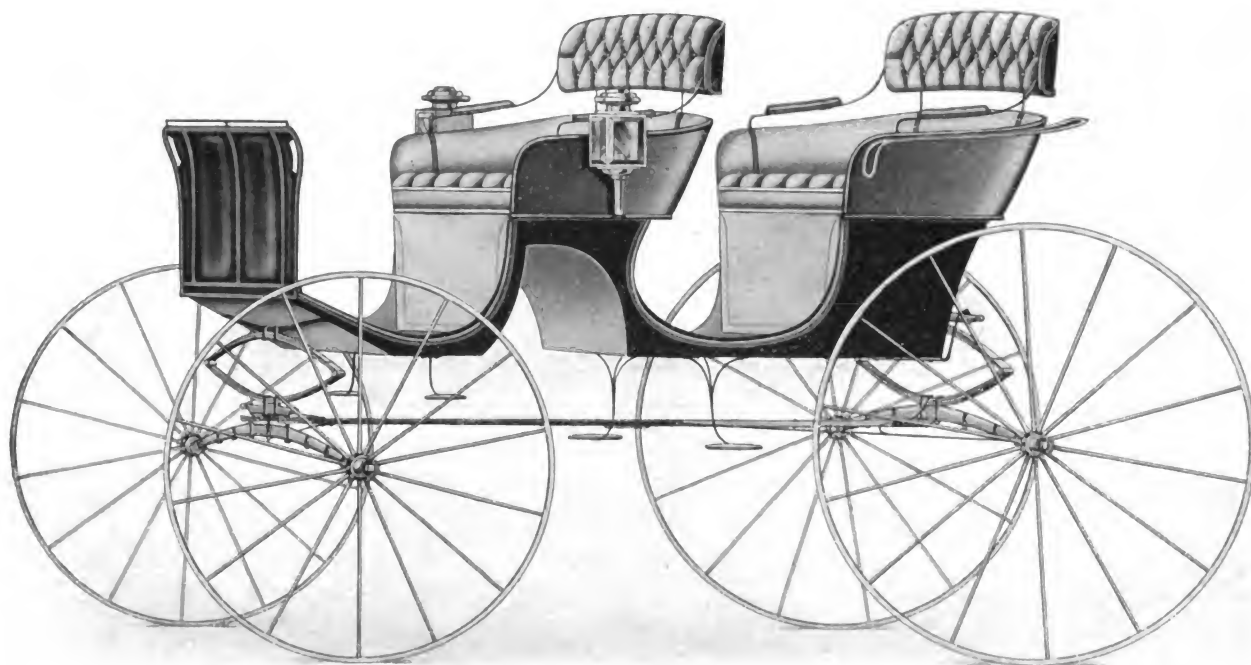
Made by
STAVEL CARRIAGE CO.,
 Chicago, Ill.



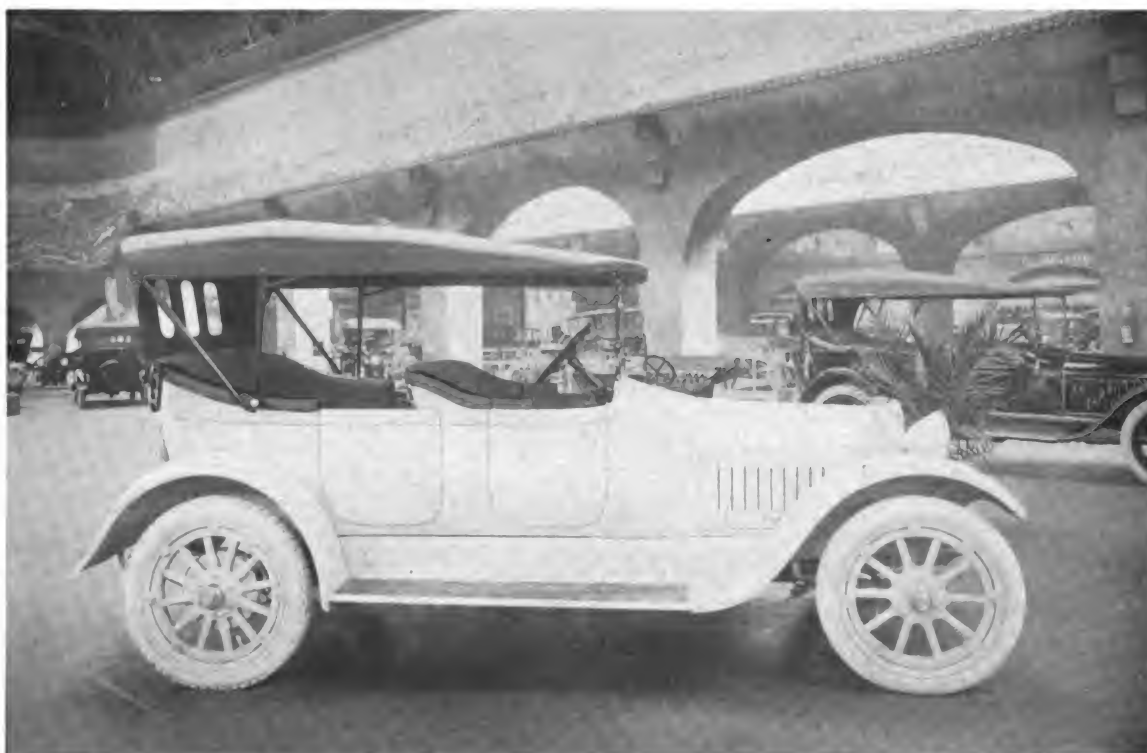
No. 77 SLAT BOTTOM BUCKBOARD
Made by
SAYERS & SCOVILLE CO.,
Cincinnati, O.



**COMBINATION CUT-UNDER TOP BUGGY AND
DRIVING WAGON—STYLE "C" AUTO SEAT**
Made by
SAYERS & SCOVILLE CO.,
Cincinnati, O.

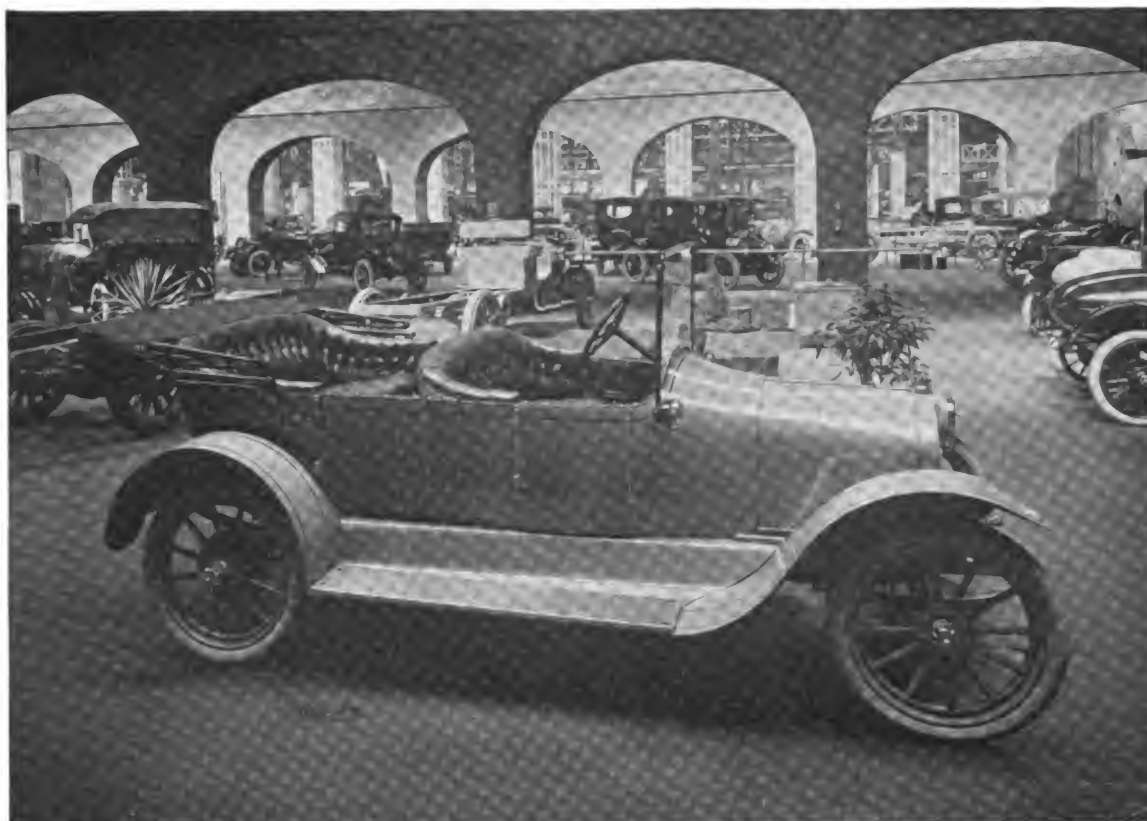


No. 89 LIGHT CUT-UNDER SURREY
Made by
D. M. SECHLER CARRIAGE CO.,
Moline, Ill.



CHALMERS CAR IN A CORNER OF THE AUTOMOBILE EXHIBIT AT THE PANAMA-PACIFIC EXPOSITION

Note the portion of relief map shown on ceiling



THE BRISCOE CAR AT THE PANAMA-PACIFIC EXPOSITION



ANOTHER VIEW OF AUTOMOBILE EXHIBIT AT PANAMA-PACIFIC EXPOSITION
CADILLAC CAR IN FOREGROUND

SOME HISTORIC AMERICAN VEHICLES

The ingenuity of the early American carriage builders in doing fine work with crude tools and very crude appliances is a remarkable attestation of their native and latent skill and capacity. They virtually entered an untrodden field and essayed tasks in the execution of which our admiration is commanded to this day. The planer, woodworker, blacksmith, machinist carpenter and wheelwright, each and all, contributed their respective parts to the future carriage and to the perfection of the handicraft of the carriage builders.

From data collected by the secretary of the Carriage Builders' National Association we present some interesting facts concerning some of the earlier vehicles made in this country:

The Conestoga Wagon

The widely separated communities scattered over Pennsylvania first suggested the Conestoga wagon. One of its peculiarities was the decided curve in the bottom, of a canoe shape, the object of which was to prevent the freight from slipping too far to the front of the wagon when going down hills, or too far to the rear when going up hills.

This wagon received its name from the fact that the horses which hauled the earliest wagons were bred in the Conestoga valley in Lancaster county, Pennsylvania, as well as from the fact that the earlier wagons were made there. It was an animating sight to see five or six highly bred horses, half covered with bear skins, or decorated with gaudily fringed trimmings, surmounted with a set of fine-toned bells, with bridle adorned with fancy trimming, moving over the ground with brisk, elastic step, as if half conscious of their superior appearance, dragging their heavily laden caravans swiftly over the uneven mountain roads.

General Washington's Coach

General Washington caused quite a sensation near the close of the 18th century, when he traveled through several states in a coach of magnificent construction.

In 1810 the Pennsylvania legislature passed a law imposing toll charges on every chair, chaise, etc., with one horse and two wheels, and on every chair, coach, chaise, stage wagon or light wagon with two horses and four wheels that should use the turnpikes.

The "Jitney" Busses of the Eighteenth Century

In 1744, stage wagons ran between New Brunswick and Trenton, N. J., twice a week. In 1750, a line was established between Jersey City and Perth Amboy. In 1751, a line was established between Perth Amboy and New York. In 1756, the trip could be made from New York and Perth Amboy to Philadelphia, via Trenton, N. J., in three days. This is the route taken by Benjamin Franklin when he made his famous boyhood journey from Boston to Philadelphia.

Coach lines were also established between Boston and Providence and between Boston and Salem, Mass. Stage lines were opened from Albany, N. Y., westward in the early years of the last century and the distances traversed ranged from 300 to 400 miles. Similar lines were established between Baltimore and Wheeling, W. Va., which distance was made in gradually reduced time, and as many as 14 coaches started out at one time, following each other, and carrying over 100 passengers. The incentive to increased speed was the carrying of the United States mails.

In 1830 coaches had reached the far west. They were great, ugly, inconvenient vehicles, built with an eye to service, and without any thought of elegance. The wheels were made of oak, with spokes like Polynesian war clubs, thickly tired, with a hub like a beer keg. Upon the axle trees, a common cart body was placed, with seats laid across. There was no pole to the coach, but a pair of shafts. A rough board behind, fastened to the coach by a pair of leather straps, served to hold the baggage of the passengers. It was a coach of this type which carried the famous sign "Pike's Peak or Bust."

In 1870, a New York coach builder built for President Grant a carriage for his personal use which cost \$1,200. It presented interesting features as to excessive height and general design. The body was raised above the axles on exceedingly high springs, which elevated the seat and the occupants, who were carried at a height considerably above the passengers of other vehicles used in the streets. President Grant frequently made use of this carriage in riding out with Mrs. Grant and in taking his sons out for an airing. The vehicle provided room for four persons, although two or three more could be crowded in. It was sold shortly after the death of General Grant, and is still in existence, the property of an American carriage builder. The carriage was regarded as a fine specimen of the specially designed, custom made vehicle in its day and generation.

A MILLION CARRIAGES LAST YEAR

As a rule, industrial statistics are dry and uninteresting, but the figures resulting from a recent census of the production of four-wheeled carriages, such as buggies and surreys, are calculated not only to interest but inspire to greater confidence all those whose thought and work are bound up with the present and future of the buggy business.

The census, made by the statistical committee of the Carriage Builders' National Association, is based on the number of wheels, poles and shafts sold by the firms making these goods for the vehicle trade, the result indicating that about one million sets were consumed in this country last year.

The same committee has compiled a list of all the manufacturers of vehicles in the United States showing an investment in their business of \$5,000 and more. This list shows a total minimum investment in the assembling and manufacturing of buggies and light spring wagon work of \$35,049,000. The investment in manufacturing establishments making accessories exclusively for the vehicle is probably as much more.

An industry in which there is invested some \$50,000,000, producing more than \$60,000,000 yearly, is certainly worthy of the most enthusiastic and exclusive attention of the men engaged in it.

MARKET FOR LIGHT TRUCKS IN AUSTRALIA

Automobile conditions are improving in Australia. On December 31, 663 motor trucks were registered in New South Wales and 690 in Victoria, showing a big improvement over one year ago. The light truck market is going to be a big one in Australia, and if dealers had hundreds of these trucks on hand today they could readily dispose of them. Quite recently business houses wanting light trucks were purchasing passenger touring car chassis and fitting them for light delivery work. While these have been successful in their light capacity something stronger has been wanting and the light truck is fulfilling this demand.

Owing to the British government commandeering the whole of the British output of trucks there is now a dearth in Australia of light motor trucks. No one has any on hand and no one can procure any from England. Importers are somewhat anxious and are hesitating whether to dabble in American light trucks or not; a few of them are now coming into the country and are beginning to sell. Light trucks up to two-ton capacity are the type most of the business houses require.

FORT SMITH WAGON FACTORY WORKING OVERTIME

The Fort Smith (Ark.) Wagon Works is working an extra force of men 12 hours a day. The force has been increased by 50 men, and now numbers 250 hands. The company has a big contract for ambulances for the Red Cross societies at work on the European battle fields. The length of this contract will be determined by the length of the war.

OFFICIAL NOTICE TO EXHIBITORS

**Forty-third Annual C. B. N. A. Convention, Cleveland, O.,
September 20-25**

The forty-third annual meeting of this association will be held in Cleveland, O., during the week commencing September 19, 1915.

At the same time and place the annual exhibition of parts of vehicles, automobiles, models, new inventions, harness, horse equipment and materials pertaining to the carriage, wagon, automobile and accessory industries, will be held.

For the exhibition purposes the committee have secured Central Armory, Sixth street and St. Clair avenue, a well-lighted building, large enough to accommodate all who wish to exhibit.

The following rules and regulations have been adopted to govern the exhibit:

Exhibitors must be either active or associate members of the association.

The exhibits must be confined to models, parts of vehicles or automobiles, and to materials used in the construction of the same, or to coachmen's outfits, harness and horse furnishings. No finished vehicle will be admitted.

This exhibition is the members' own exhibition. They can take what space they may wish, from 8 x 8 feet to 20 x 100, or larger, if they desire, and as the exhibition is entirely for the benefit of the members, and as we never know their desire about the size of space they will need until the application is received, and also on account of the manner in which the space is sold—by mail only—it is impossible for us to make a diagram of the hall. For these reasons we cannot allow each one to choose his own location when making application for space. You can readily see, if we had a diagram sent out by mail, several might choose the same location, and by so doing, lead to endless confusion.

Therefore no definite location can be allotted to any exhibitor on receipt of application. The space will be allotted in the order applications are received. Those making early applications to the secretary will secure what advantage in location there may be, and also avoid the delay in securing their space on the day of opening. As far as possible, ample room will be furnished to all.

The committee will arrange to have the exhibition space policed by day and watched by night, for the better protection of the exhibits, but cannot and does not assume the responsibility for loss or damage, from any cause, so far as individual exhibits are affected. The exhibitor must arrange and care for his exhibit, and he must assume all responsibility therefor.

Exhibits can be placed in position on Friday, September 17, and on Saturday, September 18, and the exhibits so placed must not be dismantled or removed from the exhibition hall nor shall hammering or unnecessary noise be made in preparation for removal until 6 o'clock p. m., on Thursday, September 23.

And this rule is ordered strictly enforced.

All exhibits can be removed on Friday, September 24, as the lease expires on that day.

In accordance with the agreement between the exhibitors and the president in Atlantic City in 1912, and so successfully carried out at St. Louis in 1913, and at Atlantic City in 1914, the exhibitors will close their exhibits from 10:30 a. m. until 12 noon on Tuesday the 21st, and Wednesday the 22d, so that the attendants and visitors could attend the business meetings.

With these exceptions the hall will be open from 8 o'clock a. m. until 6 o'clock p. m. each day from Monday the 20th, to Thursday, September 23, and on Friday the 24th until 5 o'clock p. m. of that day, when all exhibits must be removed from the building according to our arrangements. Our lease expires on that day.

As much of the hall as will be required will be marked off into 8, 12 and 20 feet wide sections, and aisles arranged about

the reservations as liberally as the character of the floor space of the hall will permit.

The space will be sold according to the following scale of prices:

8 x 8 feet—	64 feet.....	\$20.00
8 x 12 feet—	96 feet.....	30.00
8 x 16 feet—	128 feet.....	40.00
8 x 20 feet—	160 feet.....	50.00
8 x 24 feet—	192 feet.....	60.00
8 x 28 feet—	224 feet.....	70.00
8 x 32 feet—	256 feet.....	80.00
8 x 38 feet—	204 feet.....	90.00
8 x 42 feet—	336 feet.....	100.00
8 x 46 feet—	368 feet.....	110.00
8 x 50 feet—	400 feet.....	120.00
12 x 12 feet—	144 feet.....	45.00
12 x 16 feet—	192 feet.....	60.00
12 x 20 feet—	240 feet.....	75.00
12 x 25 feet—	300 feet.....	90.00
12 x 30 feet—	360 feet.....	110.00
12 x 35 feet—	420 feet.....	125.00
20 x 20 feet—	400 feet.....	120.00
20 x 25 feet—	500 feet.....	150.00
20 x 30 feet—	600 feet.....	180.00
20 x 35 feet—	700 feet.....	210.00
20 x 40 feet—	800 feet.....	240.00

The charge for larger space will be in same ratio.

Additional space to that already granted may also be arranged for, if exhibitors will forward application for such additional reservations one week before the date fixed and published for installation of exhibits.

Floor space only will be sold. This may be furnished by the exhibitor with desk, chairs, tables, railing, etc., to suit his needs. But the committee or its employes cannot undertake to furnish any of these articles, although a list of well-recommended local dealers, carpenters and decorators may be had by application to the superintendent of exhibits, who will do all possible to facilitate the supplying of the needs of the exhibitors.

The space allotted to any exhibitor must not be sublet to anyone not members of the association. This rule is imperative.

No signs in the body of the hall shall be so displayed as to interfere with proper observance of community interest. It must be an implied agreement on the part of exhibitors when reserving space, that the secretary, or the superintendent shall be the sole and final judge of infractions of this regulation, and his decision shall stand.

Any damage to the building by any of the exhibitors must be settled for before the exhibits are removed from the building.

The association assumes no responsibility whatever for care of exhibits, boxes, crates, etc., other than to furnish such assistance to exhibitors as will enable them the more quickly to install exhibits, and to remove the crates to a storage place where they are to remain as a matter of convenience to exhibitors, and at their risk, although the usual precautions, as stated elsewhere, will be taken to safeguard property as a whole.

Application for space should be made to the secretary now, and should state the nature of the exhibit, as well as the space required. As far as it is possible, the space will be assigned in the numerical order of receipt of application. The sure and only method of securing the best locations is to make early application.

Payment for the space taken can be made with the application, or, if the exhibitor prefers, can be made on receipt of notice early in September. Receipts for same will be returned by the secretary, and said receipts will be received as voucher for space, when presented to the superintendent at the hall.

We would suggest that goods sent for the exhibition should, if possible, be sent express prepaid. If forwarded by freight, from distant points, experience has demonstrated that there is no surety that goods will arrive when wanted, unless they are shipped at least one week before the time the freight agent declares is ample time for shipment. The freight should

be prepaid if prompt delivery to the hall is expected, after goods reach terminals.

Mark goods plainly, and in more than one place on the package or crate, as directed below, and be very careful to also mark on the package the name of shipper also. This precaution aids the committee in identifying goods in owner's absence, aids quick installation on spaces ready for exhibitor, and prevents loss by reason of non-identification.

Mark as follows: "Carriage Builders' National Association Exhibition, Central Armory, Cleveland, Ohio."

For bulky exhibits, too large to send by express, arrangements have been made with The General Cartage and Storage Co., 111 Superior Viaduct, to receive and transfer the articles intended for the exhibition, from the freight station to the exhibition. Should you desire them to take charge of your goods we would advise you to notify them when goods are sent, the route, and if possible send them duplicate bill of lading.

The executive committee request all exhibitors to be sure that they quote prices only to vehicle manufacturers.

The president of the association will appoint a "Special Committee on Exhibition" to examine the exhibits and make a report to the convention of such articles as show improvement in their special lines, or show a high order of inventive ability.

By resolution passed at the annual meeting held in New Haven, Conn., October 17, 1883, it is required that any firm or company wishing to exhibit goods at the convention, should have at least one of its partners or officers a member of the association; and the fact that a representative or employee is a member will not alone be sufficient.

Extracts from the Constitution

ARTICLE III

Section 1. The members of this association shall be persons engaged in manufacturing or selling vehicles for pleasure or freight.

Section 2. Associate members may be elected from any trade or profession pertaining to the vehicle trade, upon payment of the dues, prescribed by the By-Laws, which shall entitle them to all privileges of the association (including the annual dinner) excepting a vote on the election of officers.

Extract from the By-Laws

"The annual dues shall be \$10, payable in advance."

Application for membership should be addressed to Henry C. McLearn, secretary, Mount Vernon, N. Y.

HENRY C. McLEARN, Secretary,
Mount Vernon, N. Y.

By order of the Executive Committee of the
Carriage Builders' National Association.

CONVENTION AND EXHIBITION

Cleveland, O., September 20 to 24, Inclusive—Business Meetings, September 21, 22 and 23, 1915—Exhibition September 20 to 24, Inclusive

To the Members of the Carriage Builders' National Assn.:

Enclosed you will find the notice for the exhibition and the rules governing the same, to which we invite the attention of all our members who propose making an exhibit this year. . .

You will notice that the exhibits must not be dismantled or removed, nor any preparation for removal made, until 6 o'clock p. m., on Thursday, September 23.

All exhibits must be taken out on Friday, September 24, as the lease expires on that date.

We would suggest you notify your representatives to stay with the goods and see that they are properly delivered to the transfer company for shipment. No other persons can do this nor tell if all have been shipped. This will prevent confusion. No one can tell to whom they belong, or where they are to go, nor can any one tell if they are properly cared for, unless the owners stay by them until they leave the hall. Please so instruct your agents.

The General Cartage and Storage Co. have agreed to deliver

all freight shipments from the tracks of the railroad companies to the exhibitor's booth in the Central Armory, and at the close of the exhibition to return the goods to the railroads, at the following rates:

Consignments weighing over 300 pounds, round trip, per net ton	\$6.00
Consignments weighing over 300 pounds, one way, per net ton	3.00
Consignments weighing under 300 pounds, round trip....	1.00
Consignments weighing under 300 pounds, one way.....	.50

Payment for delivery as above should be made direct to the General Cartage and Storage Co.

All shipments must be fully prepaid and notice of shipment should be sent to The General Cartage and Storage Co., 111 Superior Viaduct.

The Cleveland Desk Co., 1380 Ontario street, will furnish furniture at the following prices:

3-foot golden oak roll-top desks, @.....	\$6.00
4-foot golden oak roll-top desks, @.....	7.00
4-foot golden oak flat-top desks, @.....	6.00
Golden oak revolving desk chairs, @.....	2.00
Golden oak arm chairs, @.....	2.00
Golden oak side chairs without arms, @.....	1.00
Golden oak 6-foot tables, @.....	5.00
Golden oak 5-foot tables, @.....	5.00
Golden oak 6-foot tables, @.....	2.50

The above prices include delivering and setting in space and removing after the exhibition is over.

Where rugs are desired, domestic Oriental design rugs will cost 15 cents per square foot, and imported Oriental rugs, 25 cents per square foot.

This information is for the exhibitors, the association having no pecuniary interest in it.

We invite your attention to the following:

Extracts from the minutes of the executive committee as published:

"In relation to the order made at the Chicago convention relative to soliciting orders on the exhibition floor the executive committee desires to call the members' attention to this, as they think a moment's reflection on the part of those not having any exhibit, will convince them that it is unfair to those who have made the exhibition hall their office and sales-room for the time being, and paid for this opportunity to meet the vehicle trade, and that it is not right for any one not exhibiting to come on the floor and solicit trade that rightly belongs to those who have exhibits.

"As any member can secure space at these exhibitions, if they desire to look for trade at same, they should take space and be on an equality with those who do.

"All members are welcome to visit the exhibition, but fairness to those who pay for the privilege of exhibiting should prevent all from making unfair use of this privilege."

The following resolution was passed at the convention at Chicago in 1908:

"Resolved, That the secretary of the C. B. N. A. be instructed by the association to adopt such regulations as to exclude from the exhibit hall all representatives of the accessory trade that are not members of the association.

"Resolved, That the exhibitors and their representatives be furnished with a badge showing they are exhibitors or representatives of the same."

In accordance with the above resolution, the executive committee, the Associate Members Association, and the secretary, as ordered, have arranged that the admission to the exhibition hall shall be by ticket, to be procured at the entrance door on registration.

This ticket will be provided free to all members of the association, both active and associate.

And also to all carriage, wagons, sleigh, automobile and motor car builders who are not members of the association.

But not to any manufacturer or dealer in the accessory goods who are not members of the association.

The exhibitors will be provided with badges for themselves and their attendants as the above resolutions call for, and

these will be delivered to them on the first day the exhibition is open.

These resolutions will be carried out and enforced and the secretary requests the co-operation of all the members in having this done.

We would also suggest that you instruct your representatives to carefully obey the rules as printed, and we will send you as many copies as you may need to provide enough for this purpose.

By order of the executive committee.

HENRY C. McLEAR, Secretary.

Mount Vernon, N. Y., June 1, 1915.

INABILITY TO ESTIMATE MANUFACTURING COSTS

One of the highest industrial and financial authorities once more and quite recently asserted that inability to estimate manufacturing costs was the chief cause of industrial bankruptcies. So much has been written and spoken on this subject that it would appear impossible and unnecessary to say anything new on the subject. The authority mentioned cited the case of a large furniture manufacturer who persistently and unaccountably undersold his competitors that they got together and determined to visit him and ask him to explain not why he did it, but how he did it. He explained by saying that his father had left him a large and valuable wooded area from which he obtained his supplies of lumber and as this did not cost him anything except the cutting and sawmill cost, he did not include it in his estimate of costs. The housewife sometimes prides herself on the low cost of making a given article by counting up the cost of the ingredients she had to purchase and not giving the value of the other ingredients she happened to have in the house.

Of course, these two cases do not apply to the great majority of cases of industrial bankruptcies, but they indicate that some elements of cost are overlooked. Many small manufacturers overlook the element of time as that does not cause a direct outlay. Others overlook the item of wear and tear, which involves the setting aside of a percentage of the selling price for the restoration of worn-out appliances. A vast amount has been learned of late years, and there is a steady advance in the direction of a correct and scientific estimate of cost. One element which it is very difficult and practically impossible to estimate is inexperience, lack of business ability, for real business ability is not so common by any means as many imagine. Another prolific cause is lack of sufficient capital, involving necessity of dependence on costly bank accommodation.

But it is not intended in this connection to go all over this well trodden field. It is only designed to emphasize the general fact as to one prolific cause of industrial bankruptcies. The race and rage for business leads thousands to overlook what should call for the closest scrutiny. The unwillingness to do so arises from the fear that some competitor will cut under. If the terrible cost of cutting under were fully recognized there would be less of it. There would be less skating on thin ice. Such business is illegitimate and notwithstanding its assumed advantages to the general public, the general public, in the long run, has to pay legitimate prices. There is somewhere, somehow, sometime, a day of reckoning. Illegitimate prices involve to those who persistently indulge in it, a loss of industrial capital which somehow has to be made up by the purchasing public.

Economic laws cannot be violated always. There is a just value for everything made and sold, and this just value cannot be set aside safely, no matter how strenuous the competition. Competition was never intended to rob producers of a part of the market value of what they produce. Competition has its field and its advantages, but not in creating industrial bankruptcies.—Canadian Implement and Vehicle Trade.

WAR'S EFFECT ON AUTOMOBILISM IN SWITZERLAND

For six months after the beginning of the European clash the use of automobiles for private purposes was entirely prohibited in Switzerland. The country suddenly roused to take active steps to protect its armed neutrality depended for mobilization entirely upon the Swiss Volunteer Automobile Corps and the vehicles owned by citizens. These were all duly registered and it was a matter of only a few days to pick from the lists those suited for the military work, to requisition them and to have them delivered up to the authorities. The cars unsuited for the work might have been left in the possession of the owners of it had it not been for a shortage of gasoline and tires in the country. It had been neglected to lay in supplies of these articles, and the government found it necessary to make sure of them for the army by forbidding everybody else to make use of them. Even in the army only the superior officers were allowed to use fuel for personal transportation, so long as the difficulties had not been met.

Very large orders for motor vehicles reached the Swiss factories, on the other hand, from Germany as well as from France, after home orders had entirely ceased. Night shifts were put to work, and one factory in the eastern end of the little country, close to Austria, is putting up new factory buildings to increase the production. On November 27 the government prohibited the export of automobile motors and of construction parts, but the export of complete vehicles was allowed under permits in each case, and many private owners shipped the vehicles abroad which had become useless to themselves. A peculiar effect was a boom in bicycles. All stocks in this article were soon sold to physicians and business persons who could no longer drive cars. Especially in Geneva, which was known as the European city having the largest number of automobiles per capita, the disappearance of the cars and the reappearance of the bicycle became noticeable in the street life.

Gasoline which was found on private hands was bought up for the army, but the prices paid were so low that no private initiative for getting the supplies renewed from abroad was encouraged, and only a total of 811 tons of gasoline reached the country in August, September and October, as compared with a normal importation of 5,000 tons during these months. In November larger quantities arrived and the trade in fuel was released, but the use of cars remained under severe restrictions for lack of tires. A Geneva importing firm offered to supply all the tires needed by the government, and meetings of protest against the continued prohibition were held in different parts of the country, but even these actions were without effect for a time, as the government had entered into a previous contract with a different tire-making concern whose large shipments were held up in Italy. Lubricating oil during all this time rose to very high figures, as new oil stores were detained in the port of Genoa for several months by the Italians.

Finally the difficulties were gradually overcome to such an extent that on February 1 the government allowed motor traffic again in all of Switzerland and also released the trade in tire subject to new restrictions that might be adopted at any time if found necessary for the defense of the country. Since then normal conditions have been reestablished, with the number of motor vehicles in circulation greatly reduced, however.—Allgemeine Automobil-Zeitung.

DETROIT WAGON MAKERS RUSHED

Detroit wagon makers report that never in five years have they received so many orders as this year, despite the auto. One firm said that it will take many years before the automobile will make any great inroads on the light delivery wagon.—Detroit Journal.



TECHNICAL SCHOOL, NEW YORK CITY, GRADUATING CLASS, 1915

Back row, from left to right—Frank Pacovsky, Frank Warren, Adolph Koppe, William Donald, Roland Richmond, Joseph Newman.
 Middle row, left to right—Julius Olivieri, Erick Wengren; Andrew F. Johnson, the Instructor; Lewis Morgan, William Fink.
 Front row, left to right—Lester Higbee, Malcolm Webber, Benjamin Woina.

**LATEST TYPES OF VEHICLES IN AUSTRALIA
 SHOWN AT THE ROYAL SHOW, SYDNEY**

There were very few visitors to the show grounds who did not pass through the vehicle pavilion, in which many of the leading coach builders competed in the various classes. Mr. George Bennett was represented by a farm wagon called "Here Again!" which won first prize in its class. It is a fine sample of Australian workmanship and design, and is constructed of Australian timber. This wagon is built to carry eight tons, and carries a frame for loading chaff. The wheels are as high as the body, which makes it of easy draft. Other features of it are the double turntable for the wheels, two brakes, and the center summers are extended to support the end rails. A ladder is carried to facilitate loading. Spotted gum is used for the body, ironbark for the wheels, and blue gum for the fellys.

A lorry, shown by Mr. C. Cooper in the class for wool-carrying sorts, gained first prize, the other shown being splendidly built but not so well adapted for the purpose. There were other well built lorries of latest design one being unpainted and others in various shades. The paint work on some of the lorries was obviously intended for show purposes, for several of them had even the iron tires painted in brilliant colors. Mr. G. H. Olding won in the 30 hundredweight (1 cwt. =112 pounds) class against keen competition, Gray Bros., Ltd., winning in the 60 hundredweight and 80 hundredweight classes. T. J. Hoskins & Son showed a strong tip dray, which secured a prize.

The Union Coach Works showed a lorry specially adapted for laundry work, having rack sides and self-adjusting draw rods. Hoskins & Son won also with a farm cart and delivery van, and Mr. H. J. Weigan was successful with a milk cart. There was an interesting collection of Australian-made bent-

wood, including shafts for all kinds of light and heavy vehicles, shown by F. Hunt & Co., while Hoskins & Son exhibited wheels, axles, hubs, and d fellys. These exhibitors divided the honors. Mr. Arthur Broadhurst made a good display of horseshoes both of iron and aluminum, which the judge pronounced excellent. The winners of gold medals were the Ashdown Carriage Co. in buggies, Mr. S. Smith in sulkies, and T. J. Hoskins & Son in heavy work. The sulkies were excellent and of a variety to satisfy the most critical buyer, and excellent phaetons and buggies were also shown.—Sydney Herald.

FRANK LAY, JR., CONVICTED

Frank B. Lay Jr., formerly vice-president of the now defunct Michigan Buggy Co., of Kalamazoo, Mich., has been convicted on a charge of embezzlement growing out of the "velvet payroll" scandal. Sentence was deferred to give the defendant an opportunity to appeal to the supreme court. His father and brother, who also were officers in the company, are under indictment. The conviction is the second obtained in the Michigan buggy case, Victor L. Palmer, former secretary, having been found guilty on a similar charge.

AMERICAN MOTOR TRUCKS FOR BALKAN STATES

Within the first quarter of 1915 there have been delivered to the Grecian government 25 motor trucks for army use. These trucks are equipped with "army" bodies and are of two sizes, 1½ and 2½ tons. All of these cars are from the factories of the Kissel Motor Car Co., of Hartford and Milwaukee, Wis., and are believed to be the first American motor trucks delivered to the Greek government.

ADVOCATES SCIENTIFIC CHASSIS*

By A. P. Brush

At least the older of my brother engineers can remember when they sold automobiles with the front end like a toboggan, fenders were an extra and "get-a-horse" was the latest thing in slang.

We have all heard about the fickleness of the automobile-buying public, but as I review in my mind's eye the development from those early machines to the modern streamline motor car I am impressed by a singular consistency. It has constantly and invariably set the seal of its approval upon progress in reliability, better performance, increased comfort to the passenger and operator, and more rational—or shall I say more artistic?—appearance.

Fenders became a part of the car. The old carriage step was displaced by the running board. Wheelbase began to lengthen and the single rear entrance tonneau was replaced by the double side entrance. The wheelbase continued to grow. The center of gravity was lowered. Passengers were given more leg room, more seat width, and doors were provided for the front seat.

In the main essentials, the modern car had arrived, but what a hodge-podge it was in appearance with its exposed frame and running board supports; with the seat lines and the door pillars conspicuous on the sides of the body; with the old horse-drawn vehicle's dash still in evidence, lacking only the whip socket.

The automobile-buying public may be fickle about some things, but there has been no uncertainty about its approval of the cleaning up of the exterior appearance. The running board apron, or dust shield, covering the frame and the running board supports, the flush sided body and the streamline, give a simplicity and harmony of appearance that is as inherently a part of the modern motor car as is the motor itself.

All of this progress in comfort and appearance which I have outlined, together with many other contributing details, such as shaft drive, electric lighting and starting, and increased power in proportion to the total vehicle and load weight, has not been secured without sacrifice.

Weight Increase Has Occurred

In spite of better materials and in spite of better knowledge and experience in the proportioning of parts, the development of the motor vehicle has been accompanied by an increase in the weight of that vehicle.

This increase in weight, while partly due to increased size and power, is also partly due to the fact that the main structural elements of the chassis have remained substantially without change for the past 12 years, and the profound change in appearance and equipment which has taken place during that period has been secured largely by the addition and elaboration of parts which, structurally speaking, are so much junk.

There may be legitimate differences of opinion as to types of motors, as to lengths of wheelbase, and there may be legitimate differences of opinion on a thousand and one other details of motor car construction and proportion, but I believe there is no difference of opinion to be found anywhere as to the advantages to be secured by a reduction in the weight of a vehicle, provided such weight reduction can be secured without increasing the cost of the vehicle and without sacrificing any of the qualities which appeal to the user.

In outlining for your consideration a method of reducing the weight of this so-called pleasure vehicle, I realize fully that the suggestions would be of little or no value if they involved any considerable increase in cost; if they involved any weakening of the structure or if they involved any increase in what may be characterized as the road noises of the vehicle.

On the contrary, I feel justified in the unqualified assertion

that the suggestions which I wish to present to you are advantageous at every point to the car builder and to the car user.

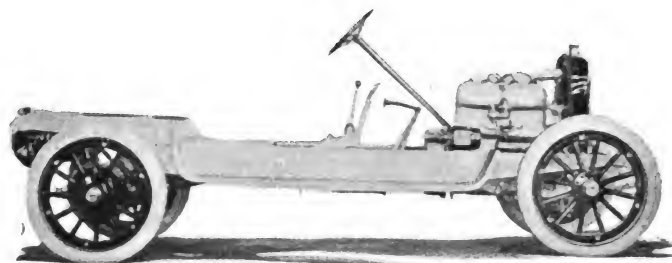
It is a matter of approximately three years since it began to be borne in upon me that the trend in the appearance of the motor car was toward a final form which would enable the structural elements of the car to be so made that a distinct gain in strength could be secured, accompanied by the elimination of a considerable amount of material, which, in conventional construction, has no structural or strength value, its only use being to secure the required appearance.

I have refrained from presenting this plan for an improved type of construction to the society until I could speak with certainty as to its proven value.

I have had prepared a number of drawings which illustrate the principles involved, and to some extent to make plain the latitude which these principles of construction allow the individual engineer in working out his own particular problem. You will agree with me that these charts illustrate a more scientific arrangement of the material used in securing in a car structure that combination of strength necessary to make a durable vehicle and that clean simplicity of appearance which is so essentially a part of the modern and future motor car.

Design Has Been Tested

In considering this proposed type of chassis construction, I want you to bear in mind that it has been worked out and tested in actual service by two engineers other than myself. Both of these engineers are men of recognized standing and



Chassis designed according to the Brush method in which the stresses on each part alone are considered in determining the dimensions and shape

ability in the automobile industry and it is their experience quite as much as my own which makes me feel confident that I am presenting material for a substantial advance in the science of motor car construction.

If you will, in imagination, open the door of a representative car of today and cut through one side of that car, you will at once realize that about half of the material cut through has no structural value whatsoever. If, for example, the material used in a modern long span bridge, were as unscientifically arranged, the structure could not support itself.

Fig. 1 shows such a section of a car, and with it a similar section with the materials arranged so that while the appearance is substantially identical, practically every bit of the material used is of structural value. The section on the right, of a conventional car structure, represents what I believe to be about the best that can be accomplished along the old conventional line, and is therefore, in my judgment, beyond criticism as a work-out where the engineer has been confined to the type of construction used. If what I have to say sounds like criticism, I trust you will bear in mind that I am only endeavoring to compare types of construction and not to find fault with the work of any engineer, or the product of any organization. It is merely desired to bring out certain well-defined points by comparison.

Weaknesses in Car Design

My purpose is to try to convince you that if engineers and producing organizations will free themselves from their habit of thought in chassis construction and consider this problem

*A paper read before the April meeting of the Detroit Section of the Society of Automobile Engineers.

with an open mind, they will realize that their own interests and the interests of the ultimate consumer can, and will, be better served by this new and more scientific use of the materials which enter into the car structure. Let me briefly point out what I believe to be some of the weaknesses that are inherent in the conventional structure.

Many of you are familiar with the destructive effect of carrying touring equipment upon the running board; a practice by no means uncommon on long trips. Can you imagine a more improper way to load a U-section, pressed steel member than by the strains transmitted through the running board hangers. A 200-pound passenger standing upon the outer edge of the running board over one of these hangers applies locally approximately 3,400 inch-pounds of bending stress upon the vertical web of the frame, and a considerable amount of yield is inevitable. If anything like the equivalent weight is strapped to the running board, these strains are repeated and intensified indefinitely over a rough road, and the integrity of the whole structure is necessarily threatened. The only answer is either

for the same amount of material used, and this difference in vertical strength is further increased by the reinforcement which the running board itself forms, so it is obvious that the simpler, and as a whole, lighter alternative section is very much stronger than the heavier and more complicated conventional section.

Absolute Rigidity Impossible

We all know that absolute rigidity under varying strains cannot be secured by any structure. Considering for a moment the heavier, weaker and more complicated conventional structure, some interesting and obvious defects are apparent. The frame is bound to deflect appreciably under driving conditions. The running board apron, not being subjected to any of the road stresses, and having, because of its form, considerable vertical rigidity, is bound to move slightly with respect to the parts with which it is associated, and sooner or later, squeaks and rattles begin to make their appearance. The same thing is true of the body frame.

Again: Considering the proposed alternative structure, it is apparent that practically every bit of the material used helps to resist these fluctuating road stresses and the rigid association of the parts, together with the greatly increased strength has proved itself in actual service singularly free from this aging action which is so inherent in the conventional structure. By forming the chassis frame so that its vertical web is directly under the outer edge of the body, and because of the great increase in rigidity which is secured, there is no longer any need for the body frame or sill, and the light weight sectional body becomes a proper and advantageous structure.

I do not mean to say that the one-piece body cannot be used, but that it ceases to be a necessary or advantageous form of construction for the open touring car.

While for purposes of comparison I have shown a frame section identical in area with that found necessary with the conventional construction, a frame section less than .1 inch in thickness has been used in connection with a wheelbase of approximately 135 inches. On this test car the sectional body construction was used. The door fit was exceptionally close, and yet, after severe tests over the rough going of Arizona, not the slightest change in the fit of the doors could be detected. During this test, an unusually heavy touring equipment was carried on the running board. No supplemental running board supports were added, and yet no suggestion of body or frame squeaks or rattles was developed.

Fig. 2 shows how the rear end of the running board may be used to form a bracket to hold the running board in plane without local twisting strain upon the frame. It also forms a very rigid and conveniently located support for the rear tonneau door pillar. The rear fender is simplified; the rear seat heel board becomes naturally a valuable structural element of the chassis construction, and the tonneau itself becomes only a side and rear wall for carrying upholstery, the rear seat cushion practically resting upon the frame itself.

You will notice that just as wide a range of location of the rear seat and heel board is secured with this construction as with the conventional construction, but with the advantage of a structurally useless part. I presume the practice of making a two-piece side member will be questioned by some of you, but as I will presently show you, this is not a necessary phase of this type of construction, still I can assure you that it has no structural weakness, and because of the more economical use of the frame stock and the simpler body fitting, this detail of construction probably makes for some cost reduction. Fig. 2 approximates the dimensions used on a 118-inch wheelbase, five-passenger car, the frame material used being 12 gauge.

Fig. 3 illustrates the possibility of using the more conventional square corner between the rear end of the running board and the rear fender. The body fitting in this construction would not be quite so simple as with the two-piece frame, and the support for the rear tonneau door pillar, while undoubtedly

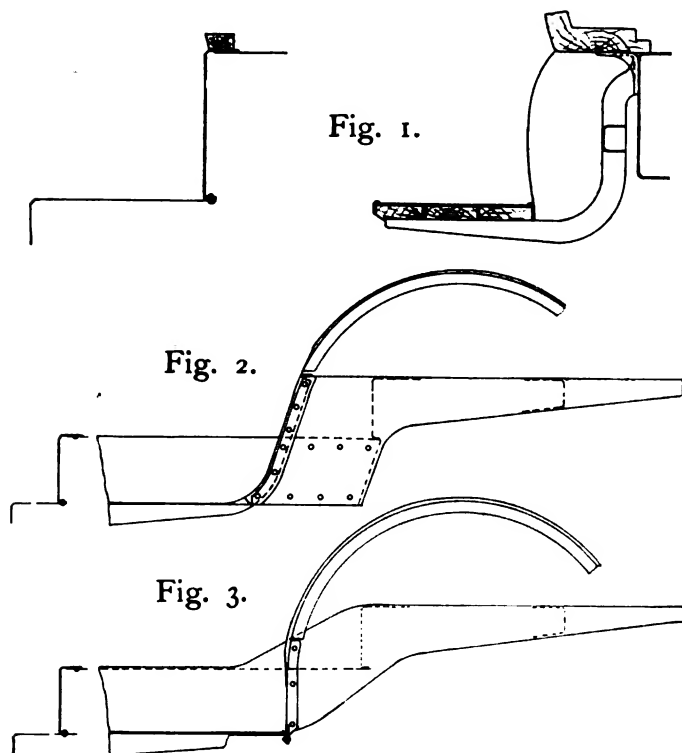


Fig. 1—Section of the conventional car and a similar section with the materials arranged to be of structural value

Fig. 2—Rear end of the running board may be used to form a bracket to avoid twisting strains on the frame

Fig. 3—Showing the possibility of using a single piece side member

ultimate disintegration in the hands of the user, or, because of the incorrect application of stresses, a needlessly heavy structure.

Now, comparing this same problem in stresses with the alternative construction shown, it is at once apparent that load at any point on the running board results in downward stress well distributed upon the vertical web of the frame. The torsion effect, as will be shown in the other layouts, is applied to the frame only at the ends of the running board where proper and adequate provision for withstanding them can readily be made.

In these two sections, the cross sectional areas of the pressed steel frame members have been kept equal, but the application of the pressed steel running board eliminates the need of any considerable amount of lower flange throughout the length of the running board. This enables us to secure a deeper vertical frame web, which, in itself, guarantees greater rigidity

ample, would not be quite so simple or quite so rigid as with the other construction.

Construction Has Adaptability

The following illustrations have been drawn for the purpose of illustrating the adaptability of this type of construction to a few of the various rear spring suspensions now in use. Figs. 4 and 5 show a form of rear spring suspension, which, while somewhat unusual, has a number of pronounced advantages,

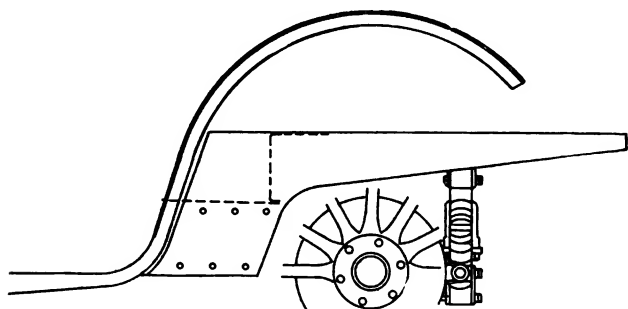


Fig. 4.

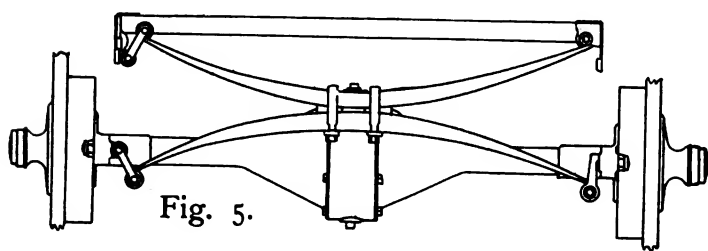


Fig. 5.

Fig. 4—Form of rear springs suspension claimed to have advantages

Fig. 5—Rear view of same suspension

and in practice has given exceptional results. Fig. 5 is a rear view and I will use it to call your attention to peculiar advantages of this type of suspension. This is, as you see, a semi-elliptic suspension where the springs act in series instead of in multiple; that is, each spring deflects only half of the total spring action. A wide loading both on the axle and on the frame is secured, and the entire mass of the springs themselves is spring borne by the lower spring.

Shackling only one end of the spring, the ride is vertical, the same as when longitudinal springs are used, and unlike the single cross spring, there is no possibility of shackle sway of the vehicle.

Fig. 6 shows the conventional semi-elliptic spring suspension and you will notice that because in this frame construction the frame side members are kept as wide as will give proper clearance inside of tires, and because the lower flange of the frame has been substantially eliminated, the spring may lie entirely within the vertical section of the frame, the front end of the spring being bracketed advantageously into the angle formed by the top flange and vertical section of the frame. I hardly think the conventional semi-elliptic spring suspension in connection with this chassis construction needs further comment.

Fig. 7 will aid in considering the problems of cantilever suspension. This spring suspension, while favored by many engineers, taxes the rigidity of the frame more than any other, and for this reason I believe this extraordinarily rigid construction will be found to have exceptional advantages where this type of spring suspension is desired. The wide frame and the narrow lower flange permitting the spring to lie inside of the vertical web of the frame and close to that web, brackets being reinforced by the upper flange of the frame immediately over them.

This vertical flange, as you have no doubt realized not only has exceptional strength because of its unusual depth, but is rigidly supported against torsional displacement by the run-

ning board, by the use of the rear seat heel board as a cross member, by its wide upper flange and by the tying of the two upper flanges together, either by the use of a steel tonneau floor or by the use of the supports at the front and back of a wood floor.

Running Board Problem Double-ended

I have not shown or discussed the support of the front end of the running board since this is obviously like the problem of the rear end. The front end of the running board may either be upturned to form its own bracket or a supplemental triangular bracket may be used immediately under the front fender. This front end support for the running board is naturally adjacent to the rear engine support which takes strains due to running board load off the vertical web of the side members. In cars using this type of chassis construction, it has been the practice to increase the width of the bottom flange of the frame members at the front end to conventional dimensions, letting this wider lower flange extend back to a point past the front end of the running board.

A type of construction, like a producing organization, is relatively efficient or inefficient, depending upon the amount of service rendered by each bit of material used. With this fact in your minds, I want you to let me turn again to Fig. 1. I trust you will all agree with me that what I have brought to you for consideration is a method of securing more service from every bit of material used in these elements of chassis construction which we have been considering. This arrangement of material has, in the hands of each of three engineers, shown decisive superiority in cost, weight and strength over their best handling of the conventional arrangement of material, and I am confident that in the hands of still other engineers, it will continue to show itself superior to the conventional type of structure.

It has occurred or will occur to some of you, that there is room for further development and refinement along this line. I should be surprised if this were not true, for this construction has, since its inception, received perhaps a total of four

Fig. 6.

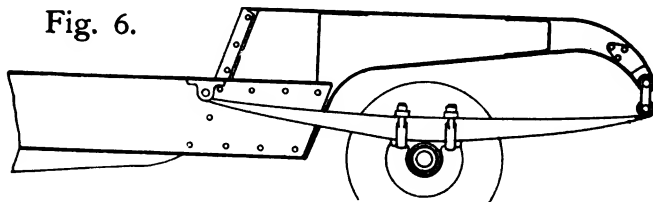


Fig. 7.

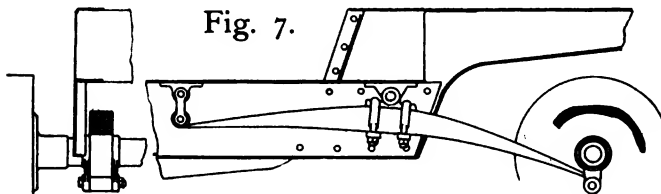


Fig. 6—Conventional semi-elliptic spring suspension, showing wide frame side members

Fig. 7—Extraordinarily rigid frame structure necessary with cantilever rear springs

or five years of engineering consideration. The conventional structure has, without doubt, received within the last 10 years 10 centuries of engineering thought and study.

I have not tried to even approximately cover the field of discussion suggested by my topic. Front and rear axle construction and the arrangement and construction of the various other chassis units are still fertile ground for the exercise of engineering ability. I have confined myself to those phases or what I believe to be more scientific chassis construction, which seem to me to need the most drastic treatment and promise most decisive improvement in the car as a whole.

CONNECTICUT LAW MUCH CHANGED

New Fees for Commercial Cars—25 Miles Speed Limit

The present motor-vehicle laws of Connecticut are completely revised by a bill which passed the House of that state on April 15. The amendments are as follows:

Commercial motor vehicles shall include all vehicles designed or used solely for the transportation of merchandise or freight which are either propelled or drawn by any power other than muscular, except such as run only on rails or tracks, and all motor vehicles designed and used as omnibuses for the transportation of passengers on the payment of individual fares.

"Police officer" or "officer" shall include any constable or other official authorized to make arrests or to serve process, provided he is in uniform or displays his badge of office on the front of his outside garment in a conspicuous place.

No manufacturer or dealer shall use any motor vehicle registered under the provisions of this section for any other purpose than the trial and adjustment of such motor vehicle or for its demonstration to a prospective buyer.

Register number shall bear the numerals of the year of issue and the abbreviation Conn.

The rear register number shall be so illuminated as to be legible at a distance of 50 feet.

No motor vehicle shall be operated upon the public highways of the state between the hours of 9 p. m. and 7 a. m. unless the engine of such vehicle shall be reasonably muffled, nor shall such vehicles be operated upon the public highways of the state between the hours of 7 a. m. and 9 p. m. unless the engine of such vehicle shall be reasonably muffled so that the explosions of such motor while so operated shall not constitute a nuisance to the public.

The secretary shall determine the actual carrying capacity of each commercial motor vehicle regardless of the horsepower thereof, and shall collect fees for registration based on such capacity as follows: Capacity of 1,000 pounds or less, \$11; one tone, \$15; one and one-half tons, \$20; two tons, \$25; two and one-half tons, \$30; three tons, \$35; three and one-half tons, \$45; four tons, \$55; four and one-half tons, \$65; five tons, \$75; five and one-half tons, \$87.05; six tons, \$100; six and one-half tons, \$112.50; seven tons, \$125; seven and one-half tons, \$150; eight tons, \$175; nine tons, \$200; ten tons, \$225; for each additional ton above ten tons, \$50, and in the determination of the fees to be collected, if the capacity of any commercial motor vehicle is found to be between any two of the above ratings, the registration shall be based on the higher rating.

The secretary may register a motorcycle with a side car attachment as a motor vehicle, which motorcycle may carry number plates as designated by the secretary, and such registration shall cover its use with or without such side car.

All hearings by the secretary on the revocation or suspension of a license or registration, based on an alleged violation of the motor-vehicle laws of the state, may be held in the county in which such violation is alleged to have occurred. The secretary, in any case, by agreement of all parties interested, may hold such hearings in any county of the state. The fees of the sheriff or deputy sheriff shall be taxed as a part of the costs in the case.

Upon approaching any street railway car that has stopped to take up or set down passengers, the person operating a motor vehicle shall, before passing such car on the side on which passengers are ordinarily received and discharged, bring such motor vehicle to a full stop not less than ten feet from the rear of such car, and may then proceed at a reasonable rate of speed, provided when any street railway car is standing at the end of any trolley line on a switch or for any purpose other than to take up or set down passengers, a motor vehicle may pass the same, without stopping, at a rate of speed not to endanger the life or limb of any person.

If the rate of speed of a motor vehicle operated on a public

highway of the state exceeds 25 miles an hour for a distance of one-quarter of a mile, such rate of speed shall be prima facie evidence that the person operating such motor vehicle is operating the same at a greater rate of speed than is reasonable.

No city, town or borough, nor any board or officer thereof, shall make any ordinance, by-law, or resolution respecting the speed of motor vehicles, or respecting the regulation, use, or equipment of the same, provided authority given to any town, city, or borough, or to any board or officer thereof, to regulate shows, processions, assemblages, traffic, or parades in streets and public places, and to regulate the use of public parks, and all ordinances, by-laws or regulations enacted in pursuance of such authority which apply to all vehicles shall remain in force.

In all complaints for the violation of any provision of this act the justice of the peace before whom the same may be tried shall have authority to render judgment and issue process of execution and mittimus thereon when such fine or penalty imposed shall not exceed \$100 or imprisonment for ten days, or both.

WELLCOME BUREAU ALTERS CONDITIONS FOR AMBULANCE DESIGN CONTEST

The Ambulance Construction Commission, formed under the auspices of the Wellcome Bureau of Scientific Research, London, Eng., which is offering a series of prizes to the value of £2,000 for the best designs for an ambulance body, full details of which appeared in the February issue of *The Hub*, has decided, as the result of certain correspondence, that it would be advisable to alter some of the conditions governing the competition, i. e., those relating to designs becoming the property of the commission, and to the arrangements for the testing and utilization of the designs.

In the revised prospectus now being issued by the committee the following change appears in paragraph (D):

(D) The commission, in order to form an opinion of the merits of the several designs sent in, may apply any test it thinks fit, and may cause bodies to be built to the designs of competitors, and may try these in actual practice. The drawings must be made in such a way that the body can be built from them.

The paragraph relating to the ultimate object of the competition now reads as follows:

The object of the commission is to improve the existing types of ambulance bodies, and to produce, if possible, a standard pattern body of perfect design which shall fit standard chassis. Apart from the prizes, there will be no payment made for designs. The commission may, if it approve of the latter, publish them in some form or other, provided there is no objection on the part of the designers. They can then be used in the cause of humanity. It is Mr. Wellcome's intention, with the consent of the designers, eventually to publish, in a suitable and illustrated form, under the auspices of the Wellcome Bureau of Scientific Research, such material and information as the commission may deem worthy of being preserved as a permanent record.

CONSIDERING MUNICIPAL BUS LINE

The Chicago board of aldermen has under consideration the establishment of a municipal motor omnibus system. The commissioner of public service has made a preliminary report on routes, with estimates on vehicles and installment of the system. The brief period required to put such a system in operation, and thus relieve present congestion, is mentioned in favorable contrast to the time that the construction of subways or other rail lines would take. Such a system adopted by the city of Chicago and working out satisfactorily would probably lead to similar institutions in many parts of the country.

DEATH OF D. M. PARRY

David M. Parry, one of the founders of the Parry Mfg. Co., president of the Carriage Builders' National Association in 1898-99, and who had served as president of the National Manufacturers' Association (1902-1906) and National Civic Association, died at his home at Golden Hill, his estate northwest of Indianapolis, on May 12. He was 63 years old.

Death was directly due to uraemic poisoning and heart trouble, from which he had been suffering for some time. He had been confined almost constantly to his bed during the last few weeks, and his health had been declining for several months, following his return from a partial trip around the world last year.

Mr. Parry at one time exerted a powerful influence in national and local affairs. It was said that he had disposed of practically all his business interests before he left last year on his contemplated trip around the world.

Mr. Parry was born a poor boy and his rise to wealth and distinction was made through his own ability to handle men



and large undertakings. Probably no man in Indiana was more widely or better known.

His name was brought prominently before the public last year when accompanied by John Kirby, a former president of the National Manufacturers' Association, and other members of the foreign committee of that organization, he left on a trip around the world. The purpose of the trip was to study the forms of government of other countries and inquire into the commercial relations that the United States had with them.

They were stopped on the trip when they were just about to sail from San Francisco, when the lobby investigation began in Washington before the senate committee in which M. M. Mulhall figured prominently. Mr. Parry and Mr. Kirby returned to Washington and testified before the senate investigating committee.

Mr. Parry later left the country and visited Australia, New Zealand, China, and was just about to cross Siberia on his way to Russia when the European war broke out and he was forced to return to this country. When about three days out of San Francisco on his return from Japan, Mr. Parry suddenly became ill and had to be taken to a hospital in San Francisco after his arrival. He was met in that city by Mrs. Parry and later was brought to his home in Indianapolis.

Mr. Parry achieved national distinction while president of

the National Manufacturers' Association because of the antagonistic stand which he took toward the activities of organized labor and the American Federation of Labor. Mr. Parry was generally credited with being one of the leading forces which, during the administration of President McKinley restored an equilibrium between capital and labor in this country. While president of their association, Mr. Parry came out strongly in favor of the manufacturers of the country to exert a stand against the activities of organized labor.

Friends of Mr. Parry said that he was not opposed to labor and that the laboring man was always helped and encouraged by Mr. Parry.

He was known to be kind to his own employes and to those with whom he came in close contact. He was known as the author of "The Scarlet Empire," an anti-socialistic novel, which appeared a few years ago.

Golden Hill, Mr. Parry's estate, occupies a beautiful tract of land of 100 acres adjoining the old Country Club. Mr. Parry bought the property several years ago and built a beautiful home to be used as a country residence. The grounds are spacious and filled with many beautiful trees, interlined with driveways.

Mr. Parry was born in Allegheny county, Pennsylvania, near Pittsburgh, March 26, 1852. He was a son of Thomas J. and Lydia (McLean) Parry, who were natives of Pittsburgh. The Parry family is of Welsh origin.

David M. Parry was about nine months old at the time of the family removal from Pennsylvania to Indiana. He passed his youth on the home farm near Laurel. At the age of 16 he left the farm and became a clerk in a general store in Laurel at the wage of \$10 a month. Eighteen months later he went to Lawrenceburg where for two years he was clerk in a dry goods store.

In 1872, he went to Columbus City, Ia., where he passed a few months as clerk in a store conducted by his brother Edward, now a resident of Indianapolis.

From Iowa, David M. Parry went to New York City, where for one year he was bookkeeper for the New York Enamel Paint Co., after which he was employed as a salesman in a wholesale dry goods house until 1873, when he returned to Indiana and moved to Connersville, where he and his brother Edward engaged in the hardware business.

Mr. Parry then became a traveling salesman for a wholesale hardware house in Cincinnati. He continued in this employment three years and then bought a hardware store in Rushville, Ind., which he conducted until 1882, when he sold out and then bought a small carriage shop in that place, continuing in business on a modest scale for two years, and in 1886 removed to Indianapolis. Here he rented a part of the old Woodburn-Sarven wheel works and began the manufacture of vehicles and farm implements, meeting with success from the start. He began operations with 40 persons on the pay roll and as the years went on this number increased to about 2,000, and its product of lightweight vehicles came to be known all over the world.

For several years his brother, Thomas H., was bookkeeper for the establishment in which he had an interest from the beginning, and in 1891 his brother St. Clair entered the firm. In 1899 the eldest of the brothers, Edward, came into the business, which was conducted under the name of the Parry Manufacturing Company. In May, 1909, D. M. Parry resigned the office of president of the Parry Manufacturing Company, and became president of the Parry Auto Company, which was incorporated July 28, 1909, with a capital stock of \$1,000,000.

In 1904 Mr. Parry organized the American Manufacturers' Mutual Fire Insurance Company, with headquarters in Indianapolis. He was chosen president. In 1909 he became president of the Auto Insurance Company of America and vice-president of the Indianapolis Southern railroad.

He was a member of the First Baptist church, a thirty-second degree member of the Ancient Accepted Scottish Rite Masons, an Odd Fellow and a member of the Benevolent and

Protective Order of Elks. His first wife, Mrs. Cora (Hartbottle) Parry, whom he married in Brooklyn in 1875, the Rev. Henry Ward Beecher officiating, died in July, 1882. The two children of this marriage who survive her are Mrs. Helen Fitzgerald and Mrs. Warren D. Oakes, of Indianapolis.

On October 3, 1883, Mr. Parry married Miss Hessie Maxwell, of Indianapolis, who survives him with the seven children of the second marriage—Mrs. W. C. Teasdale, and Maxwell, Addison, Isabel, Ruth, Jeannette and David Parry.

Besides the children Mr. Parry leaves three brothers, Thomas H., St. Clair, and Edward R. Parry, and one sister, Mrs. Jennie Griffith, all of Indianapolis.

DEATH OF NOTED WHIP WHO SPENT SMALL FORTUNE ON COACH HORSES

The tragic death of Alfred Gwynne Vanderbilt, one of the Lusitania victims, will have a far-reaching effect on horse shows in America. Mr. Vanderbilt was an ardent horseman. He was the moving spirit of the National Horse Show Association of America and at the time of his death was its president. This organization has held shows yearly at Madison Square Garden except last season, when, because of the war, there was none.

Mr. Vanderbilt spent a small fortune each year on blue blooded horses. He was a true sportsman and cared only for the satisfaction derived from owning a good horse and only exhibited for cups and ribbons. He was considered one of the best whips in the world. His fancy ran toward road coach horses, hackneys, hackney ponies and horses suitable for park drawing coaches.

His one great hobby, almost amounting to a passion, was coach driving. For years he ran a coach called the Venture from London to Brighton, the fashionable watering place of England. In order to operate this coach he kept 56 horses in training in England. The coach usually made the trip in 7½ hours, which included stops for luncheon and tea.

His most celebrated team was made up of four grays—Viking, Valor, Vanity and Vogue. This team went back and forth from America to England four times and Mr. Vanderbilt drove them four seasons. In all, counting their trips on the ocean, these grays traveled 21 000 miles.

Last season Mr. Vanderbilt won the coaching marathon from Hyde Park to the Richmond Horse Show on June 18, beating 27 teams for the first prize. He won with a team of bays attached to a park coach and captured second prize with a team of grays attached to a road coach.

It was business relative to his horses, it is said, that caused him to make the trip that proved fatal to him. Mr. Vanderbilt wintered and trained most of his horses at Oakdale Farm, Newport. Counting stallions, brood mares and harness horses, he had in his string nearly 300 horses.

As a direct result of Mr. Vanderbilt's death racing is to lose for this season at least one of its most prominent figures—Harry Payne Whitney. Mr. Whitney, who is Mr. Vanderbilt's brother-in-law, has leased his racing stable to L. S. Thompson, of New York City. Mr. Thompson is well known on the turf, although of recent years he has not taken a very active part in the sport.

The lease means the transfer of the largest racing establishment in this country, as well as the transfer of the string racing for Mr. Whitney in England under the management of A. J. Joiner.

By the terms of the lease James Rowe will continue to train the horses and they will fill the engagements that were made for them by Mr. Whitney. There are at least 30 horses in the stable and they have been liberally engaged in all the best stakes of the year. Besides Regret some of the principal horses in the deal are Borrow, Harmonicon, Pandean, Prince Henry, Spun Glass, Sam Slick, Etruscan and a big string of two-year-olds.

THE SMITH AND THE AUTOMOBILE

Automobiles are here and here to stay, and like all other vehicles, if used, they will wear out and break down and, therefore, must be repaired. It is up to the smith of today to see that he gets his share of this work. A shop should be fitted up so that auto work would be kept separate from the regular wagon and shoeing department, also the tools should have a place and be kept there and used for no other work. Most auto work is not of the standard size and therefore requires different wrenches. The man who tries to use a wrench that does not fit snug but twists the edges off the nuts is not up to his job. Another tool that needs especial attention is the jack. One should have more than one and be sure they are the best and in good order. After jacking up a car it is good practice to block it up with some blocks cut for the purpose. Be sure the wheels are properly blocked. I have seen jobs let down from neglect of this.

There are a few standard cars. It is good practice to keep supplies of these as one can many times replace the broken part quicker than one can repair. Take the man with the broken spring. He is in a rush to get to his journey's end, and wants to know of the smith how long it will take to get him on the road. The smith states what he thinks would be the time, but this will not do. Can't it be done quicker? The smith tells him he has a new spring of that make which he could get under the car much quicker than he could repair the old one. The man jumps at the chance and tells the smith to get at it and get it on as quickly as he can. The exchange of springs is quickly made and the traveler, pleased to be on his journey, does not consider the cost. The smith is also pleased with the price of two springs in his pocket, and now the thing for him to do is to get the broken spring repaired. For with a coat of paint on the old spring, he is ready for the next job of the same kind.

There are a few things one should get in the habit of not doing. One is using fenders, seats or even the running boards as tool racks. Fenders scratch easily, seats do not look well with greasy tools on them and there has been many a good tool lost by being left in the car and carried away. If this should happen you need not expect to see it again.

There is no one thing more useful or one that will pay more dividends than a good welding plant, says H. N. Pope, in American Blacksmith. The work that can be done on one of these is without number. Many a part would have gone to the scrap pile but for one of these welding machines. It saves both time and money. If you have had poor success with one of these machines, don't blame the machine. Get thoroughly acquainted with it, follow the directions and you will have no trouble.

STUDEBAKER TELLS OF MODEST START

J. M. Studebaker, Sr., South Bend's pioneer blacksmith, was the principal speaker at the convention of the Indiana Master Horseshoers' Association in South Bend, Ind., April 9. Mr. Studebaker, in his address, told how he had opened a little blacksmith shop in which he and one brother were employed. Today the Studebaker blacksmith shop has grown to the mammoth Studebaker automobile and vehicle industry in South Bend and Detroit.

INJUNCTION TO RESTRAIN SWINEHART

An injunction to restrain the Swinehart Tire & Rubber Co., of Akron, O., from selling a type of non-skid tire on which the complaining company claims a patent, has been filed in the federal court at Cleveland by the Keaton Tire & Rubber Co., of San Francisco. Damages are also asked. The petition claims that the tire was invented in 1910 by Robert Keaton and that the Swinehart company has sold tires infringing on Keaton's patent for a profit of at least \$50,000.

GOVERNMENT OFFICIAL REPORTS ON DEALER ASSOCIATIONS

Joseph E. Davies, Commissioner of Corporations before its merging with the Federal Trade Commission, has made a report to the President, dated March 15, 1915, but withheld from publication until recently, regarding implement and vehicle trade associations.

The report of Commissioner Davies is as follows:

LETTER OF SUBMITTAL

Department of Commerce, Bureau of Corporations,
Washington, March 15, 1915.

Sir: I have the honor to submit herewith a report on the principal associations in the farm machinery trade.

An Organized Industry

Almost every important manufacturer in the farm machinery industry is a member of the National Implement and Vehicle Association. The dealers in farm machinery have organized the National Federation of Implement and Vehicle Dealers' Associations, which is composed of numerous state and interstate associations. These two organizations are national in scope and work in close co-operation.

Efforts of Manufacturers' Associations to Fix Wholesale Price

In the earlier days the various associations of manufacturers of farm machinery, implements and vehicles, had agreements as to uniform prices. Such agreements were difficult to maintain on account of wide variations in the construction and cost of machines of different manufacturers.

Later, the National Wagon Manufacturers' Association from time to time adopted recommendations that each member should advance prices by the same per cent. Active efforts were made to secure compliance with these recommendations. Prices for certain parts of farm wagons, approved by the association, were also recommended to members for adoption.

The organized plow manufacturers use standard classifications, standard equipment for various implements, and uniform list prices on some of their products, with differentials for specified variations from the standard adopted. These prices are subject to such discount as individual members may desire to give. Advances in list prices have apparently been used as a means of advancing net prices.

The National Association of Thresher Manufacturers has at various times approved lists of net "amounts," or prices below which it was claimed members could not sell except at a loss. In 1909 some members who were reported to have engaged in price cutting were asked to reconsider their prices.

Both the wagon and plow associations also attempted to secure greater uniformity in construction in order to facilitate price agreements.

Uniformity of Cost Accounts as a Means of Price Control

The fear of prosecution under the anti-trust laws, as well as practical difficulties in making direct price agreements, led to other methods of influencing prices.

Co-operation in efforts to maintain prices made it apparent that this object could be more easily attained if each manufacturer made full allowance for every element of cost as a basis for determining profitable prices. For this purpose uniform cost-accounting systems were devised in order that prices based on costs so computed would be sure to afford a profit. Costs were made to include not only every item of actual expense and depreciation, but also provision for interest on investment. This plan was adopted by the wagon and the plow associations and later by the National Implement and Vehicle Association, in which they were merged.

Exchange of information regarding the costs computed in this manner and the prices actually received, affords a means for determining prices profitable to all. If the individual members fix their prices accordingly, substantial uniformity in prices may be established as effectively as by an express price agreement.

Efforts to Reduce Cost of Manufacture and Distribution

These manufacturers' associations have also attempted to increase profits by reducing costs. These efforts have been mainly in standardizing specifications for materials and construction, in securing lower freight rates, in procuring insurance at reduced cost, in limiting credit risks, and in eliminating various items of selling expense.

Some of the suggestions made for reducing the cost of selling goods are significant, especially the elimination of canvassers, commission contracts, and the sale of goods on exceptionally long terms.

Efforts to Secure Favorable Legislation

Among the matters of legislation to which the manufacturers' associations have given special attention are: Taxation of corporations, industrial indemnity, manufacture of implements and twine at state penal institutions, the tariff, and patents.

Efforts of manufacturers' and dealers' associations to influence legislation, both state and national, have taken various forms. Members have been urged to write or telegraph to legislators at a given time; delegates have presented the views of the associations before legislative committees, and these associations have co-operated with organizations in other branches of industry when legislation affecting their common interests was under consideration.

The National Federation of Implement and Vehicle Dealers' Associations is affiliated with the National Federation of Retail Merchants, and various manufacturers belonging to the National Implement and Vehicle Association are also members of the National Association of Manufacturers. These affiliations afford a means of co-operation with other trade associations in expression of views regarding proposed legislation.

Effect of Concentrated Control of Patents on Price of Wind Stackers

The wind stacker attachment for threshing machines is sold at a uniform price; this is accomplished through a system of uniform patent license contracts. The principal wind stacker patents are owned or controlled by the Indiana Manufacturing Company, and most of the stock of this concern is owned by the managing directors of one of the chief threshing machine manufacturing companies. Manufacturers using these patents must pay a fixed royalty on each wind stacker made, and agree to maintain a uniform selling price.

The particular facts with respect to this situation raise several questions of public concern, namely, whether the Indiana Manufacturing Company's control of wind stacker patents transcends the monopoly contemplated by the patent laws; whether the method by which various patentees are induced to pool their patents is obnoxious to the anti-trust laws; whether the control of the said company by the managing directors of one of the licensees is compatible with public policy; and whether the said company may, in its license contracts, lawfully fix the selling prices of wind stackers made under its patents.

The Control of Retail Prices

The prevention of price cutting among retailers and the raising of retail prices have been a matter of great concern to the implement and vehicle trade.

The associations of dealers have sought from the beginning to discourage the practice of price cutting, and certain small associations in some instances have attempted to fix the prices at which their members should sell. Later, the principal associations gave considerable attention to the possibility of securing greater harmony among competing dealers by the organization of local clubs. At the meetings of these local clubs the question of prices was often discussed.

Some implement manufacturers have sought the solution of this problem by fixing retail prices in their agency contract with dealers, a practice which has been expressly favored by some dealers' associations.

In 1909 a movement was inaugurated by the organized manufacturers to secure the co-operation of all classes of the trade

in aiding retailers to secure higher prices, by educating them to the necessity of computing all items of expense in fixing their prices. Cost suggestions enumerating such items were prepared by the manufacturers and given wide circulation among the dealers. The fact that the dealers were urged to include in their costs allowances for interest on investment, rent of buildings owned and used, and salary for the owner of the business, clearly shows that these cost suggestions were intended as a method of establishing a basis at which dealers could sell at a profit.

The success of this plan, however, requires that it be followed by all dealers in the same locality. The organized manufacturers and dealers therefore undertook a campaign to promote local clubs which should include all dealers in each locality. The local clubs were urged to adopt these cost suggestions, but to avoid price agreements.

The manufacturers' association has suggested that each local club should ascertain the average percentage of selling cost to sales for all of its members. The use of this average cost by each member in fixing his own prices at once suggests itself.

Such a practice would tend to raise the general level of retail prices, and would militate against the independent action of dealers in the same locality in making prices.

Opposition of Dealers to Direct Sales and Sales Through Irregular Dealers

The fundamental idea of the federated associations of implement and vehicle dealers is that "to the retail dealer belongs the retail trade." They insist, especially, that it is wrong for any manufacturer who sells through regular dealers also to use any other method of distribution which threatens to impair the trade of the dealers. Hence, they offer vigorous opposition to direct sales to farmers, to sales made through irregular dealers, and to sales through mail order houses.

The opposition to these forms of distribution is based on the claim that sales so made are made at prices which are demoralizing to the trade of the regular dealer, who is obliged to maintain a store with a stock of goods sufficient to meet the demands of the locality. The dealers' associations contend further that the plan of selling through a regular dealers is more economical for the manufacturer than any other plan of distribution, and that the dealer renders better service to the farmer.

This claim of the dealers to the retail trade has been endorsed by the National Implement and Vehicle Association. The latter, and also various jobbers' organizations, have co-operated with the dealers in enforcing this claim. The dealers' associations have facilitated such co-operation in various ways, including the publication of directories containing the names of regular dealers.

Methods of Enforcing Dealers' Claim to the Retail Trade

The great problem of the dealers' associations has been to find some lawful means by which the members may be notified of the name of any manufacturer who declines to confine his trade to the regular dealer.

The adjustment of complaints against individual manufacturers who have made direct and irregular sales has been an important part of the work of the dealers' associations. When a complaint of this sort is filed with one of the associations, its secretary endeavors to arrange a settlement, sometimes by collecting a commission and securing a promise that such sales be discontinued. Most complaints are adjusted by the secretary. Complaints which cannot be settled in this way are referred to a committee of the association before whom the manufacturer is sometimes invited to explain his position.

Members of some of the earlier dealers' associations agreed to withdraw their trade from manufacturers who refused to settle complaints to the satisfaction of the dealers, and until within the last few years the names of such manufacturers appear to have been freely discussed before the entire membership of the various dealers' associations.

An attempt in 1905 to install an information bureau to furnish dealers with the names of offending manufacturers and jobbers was not carried to completion owing to some doubt as to its legality. Members of the various associations have been notified, however, that upon request to the secretary of the association of which they are members, they would be furnished with information as to the trade policy of any manufacturer.

Court decisions adverse to such activities of dealers' associations, and investigations by the government, have caused the federated implement and vehicle dealers in recent years to be cautious in handling complaints. At present the federated dealers' associations appear to rely principally upon the National Implement and Vehicle Association and the various jobbers' clubs to persuade their members to confine their trade to the regular dealer. There are some manufacturers, however, who will not sell exclusively through regular dealers unless they are compelled to. The dealers desire, therefore, to create among such manufacturers a belief that the dealers will withhold their patronage if they persist in ignoring the dealers' claims. As already noted, the National Federation of Implement and Vehicle Dealers' Associations is affiliated with the National Federation of Retail Merchants, and the latter organization has sought to secure legislation from Congress under which retail associations may legally furnish their members with information regarding manufacturers whose trade policy they object to.

While the organized dealers disclaim any intention of maintaining a black list, or of instituting a boycott against anyone, it is clear that if they be permitted to disseminate information of this character, those loyal to the principles of their associations would refuse to continue business relation with offending manufacturers, even in the absence of an express agreement to do so.

Opposition to Mail Order Competition

A determined fight has been made by the organized dealers against the competition of mail order houses. They have not only tried to prevent manufacturers from supplying implements to such concerns, but also have conducted a campaign to prevent the establishment of a parcel post, on the theory that such facilities would benefit the mail order houses. Since the establishment of the parcel post they have urged a revision of postal rates, with a view to increasing the charges on parcels. Their opposition to the mail order houses has also been the reason for favoring a federal law to compel all manufacturers to brand their names upon their products in order to identify manufacturers who sell to mail order houses, and for favoring both state and national legislation to prevent misrepresentation in advertising because of the belief that such laws would compel a modification of claims made in mail order advertisements. The organized manufacturers and dealers have also made earnest efforts to curtail the advertising facilities of mail order houses by persuading manufacturers who sell through dealers not to advertise in farm papers which contain mail order advertisements, or encourage buying from mail order houses.

Conclusion

In conclusion it may be observed that while a large part of the activities of the manufacturers' and dealers' associations in this branch of industry are proper for the protection of legitimate interests, yet there are others of doubtful legality which tend to limit the field of competition and to enhance prices.

Very respectfully,

JOSEPH E. DAVIES,

Commissioner of Corporations.

The President.

According to a London journal American bolts for wagon building are said to be more in favor in South Africa than English makes, on the ground that they will bear a greater strain and are better finished. The heads of English bolts are also liable to snap.

Paint Shop

CHOICE OF COLORS FOR AUTOMOBILES

No Excuse for Mongrel Combinations

Automobile painters and users have no justifiable reason for seeking to decry the lack of variety of colors for the horseless carriage. It is true rather that all the colors of the rainbow, and more, have been virtually tossed at the feet of the painter with the command, "help yourself." That this "feast of good things" may prove the undoing of the craft is an accusation that we, in these recent days, have heard oft repeated, but upon examination we find little to substantiate the view. Of all vehicles, the automobile in the diversity of its style, and the wide latitude permitted the designer in his conception of form and contour and what will best please the consumer, is least endowed with attributes which prescribe definite limitations in the matter of color schemes to be employed. While the automobile may not properly at this time be called the machine of the masses, it is at least sufficiently a vehicle of general use to merit the distinction of adapting itself to a widespread variety of colors.

While this unrestricted selection of colors, and schemes of colors, has allowed the painter to depart from what the rules of art define as propriety, it has at the same time afforded the magicians of the craft an opportunity of exercising their ingenuity in devising combinations calculated to attract attention by force of the novelty invested in them. These novelties, it must be confessed, have approached dangerously close to the border line separating the domain of the sensational from that of the artistic, but they have, nevertheless, illustrated the color possibilities belonging to the vehicle branch of the painting craft.

For the most part, however, the "loud" combinations and sensational effects have a mere demi-monde effect, and are to be condemned—in fact they have already been condemned. Even the manufacturers, who in the past have been a law unto themselves, riding, as it were, "rough shod" over what the horse-drawn vehicle public has conceived as art, are this year paying due heed to what intelligent users acknowledged as their rights in the matter. In other words, that great, indefinite influence which we call fashion, has lifted up its voice in indignant protest, and henceforth must be heard.

And yet this does not mean that the painting of the automobile should be, nor is likely to be, narrowed down in choice of colors to the solemn and dignified pigments which control the colors applied to the horse-drawn vehicle. The colors of sparkle, of gayety, of life, of the soft voices of music, if you will, are still to be in favor with the auto-using public. But between such colors selected and posed upon the surface with the subtle art of the experienced colorist, and those other substances which outrage the laws of harmony and offend the sense of nice combination, there is a sharply defined barrier.

Men of acute trade and craft perception have come to a full realization of this fact, and we believe this knowledge will clarify the situation, and enable even the layman to see with a clear vision.

Hitherto the automobile painter has to a greater or less extent, markedly the jobbing shop painter, been at the mercy of the lady motorist, the demure creature of the drawing room, who, along with her fastidious conceptions of feminine apparel, elects to intrude her notions of exclusive raiment into the automobile paint shop for the guidance of the inmates.

And the result has been, as a rule, creations of a fearful and

wonderful pattern, having neither part nor lot with anything that might come within a reasonable definition of art.

In one of the most exclusive paint shops of New York, recently, the writer saw an automobile, the color upon which had been ordered by the fair owner of the machine, and to say that it was obnoxious is speaking without severity. The color was a mongrel, and quite unworthy of a name, and yet this same machine went into service, and the color for a brief space was the talk of Manhattan, and society fluttered excitedly over the name which milady had given the pigment, and other automobiles limped bravely to the shop for a smear of the blue; but today this same color is a social outcast.

The fact is, that while variety in the choice of colors is desirable, even necessary, that variety, insofar as selection is concerned, had best be left, generally speaking, to the painters themselves. To them the study of colors is, or should be, at any rate, what the study of music is to the musician, or the study of the stars is to the astronomer, and from this point of vantage they may be expected to make selections suited to the size and general design of the vehicle without transgressing the rules of harmony and contrast as applied to form.

Admittedly, not all painters are colorists, but the shops, happily, are comparatively few in which the foreman painter, or some expert journeyman painter, is not fully capable of making, after the wants of the owner have been ascertained, a color design both harmonious with the lines of the automobile and artistically effective.

Any so-called standard of automobile colors is manifestly bound to be elastic so long as each manufacturer is intent, as at present, upon setting up an exclusive or individual standard, but there is one standard, despite every untoward influence directed against it, which is destined to prevail, at least ultimately, and that is, in a word, the standard of good taste. Here and there, to be sure, will be unearthed violators of the compact, but they are as insects upon the great face of nature.

When a survey of the colors at the disposal of the automobile painter in this good year is made, it will seem scarcely necessary to resort to freak combinations and livid reminders of aboriginal attempts at ornamentation, in order to compel the attention of the users and prospective buyers of the chug-chug machines.

There is a sufficiency of gay pigments which, when united becomingly upon the surface or used in harmonious relationship to one another there, have abundant resources for winning the admiration of the public. Scan, for example, the fruitful list of reds extending along all the way from American vermilion to the ever popular maroon, with the magnificent family of green pigments, the blues of wondrous hue, the yellows which fill the eye with color, the lakes of royal plumage, and a vast concourse of intermediate colors hardly secondary in importance, and you will discover scant excuse for the employment of inappropriate pigments upon the Goliath of the vehicle world—the automobile.

SPOTTING OF VARNISH

During the spring and early summer months the jobbing shop painter meets with many and varied difficulties in handling and getting his varnish supply into service. The average country paint shop, with a varnish room more or less unadapted to strictly high class results, and located in districts where pavements and water hose connections are unknown, handicaps the finisher to an extent not easily understood by those outside of the trade.

In the spring and early summer the painter doing business in the country or village shop must guard continually against getting his varnish into service before it is sufficiently hard to withstand the effects of mud and other injurious substances common to rural highways. The varnish upon a surface when dry enough to use in city service, would in most cases be insufficiently hard to use over country roads. Moreover in the city the vehicle user, or his servant, is more particular in the matter of washing his carriage immediately after a drive that "muddies" the varnish than his friend of the country who does not understand, or perhaps does not care, that mud or dirty accumulations are highly injurious to varnish if permitted to dry upon the surface. Against this class of service the painter must enlist his best energies, conducting a campaign of education until his customers become schooled in the art of caring for the newly finished carriage in a proper way.

Perhaps some proprietors of country shops meet with difficulty in using high grade varnish upon their work. Such an one lately wrote that he recently tried to successfully finish a certain job with an English varnish of world-wide repute, but failed. Undoubtedly, local causes and conditions, and not the varnish, were the chief reasons for the failure. It is well understood, or should be, that the higher the grade of varnish, the more delicate and sensitive its nature, and, if you please, its temperament; necessitating, among other things, a practically perfect surface for its reception and its subsequent support. Most English varnishes of high grade are light in body and for the display of their chiefest charms require a surface of surpassing smoothness and depth of body. And such surface conditions are not always to be had in the small shops, and for the money which carriage owners outside of the large towns and cities are willing to pay for painting.

These exceedingly fine and delicately adjusted varnishes need great care for a long time after going into service. Frequent washings and housing in apartments well ventilated and absolutely free from atmospheric impurities being urgently necessary. And what is true of the highest grade English varnish is likewise true of the same grade made in this country. For a strictly fine, high class surface, upon which unlimited skill has been expended, and which is guaranteed the care necessarily a factor in the early life, at least, of such surfaces, the writer would advise the employment of the high grade American or English varnish, but for all other surfaces, and the conditions of service which usually obtain in American communities, high quality, but less sensitive varnishes are recommended.

Some varnishes are much more sensitive to mud or other accumulations and, therefore, spot more easily than others; and highly elastic finishing varnish with a large percentage of oil in its composition, spots more easily than other kinds. The spotting of varnish from mud accumulations gives the painter more trouble, as a rule, than all other forms of spotting. City mud, which is commonly charged with a high percentage of ammonia, and the mud of lime districts, constitute the most destructive road accumulations against which the painter is apparently expected to safeguard his varnish. The mud acts upon the varnish in this wise: When allowed to dry upon the freshly varnished surface, the suction, or technically, the capillary attraction of the dry mud extracts the oil from the varnish, causing the dull, lifeless splotches to appear. In some cases, as chemical experiments have shown, the spotting is due to the actual saponification, by the alkaline mud, not only of the oil, but of the gum constituent of the varnish.

Spotting of this kind, as indeed, spotting from mud accumulations of the mildest sort, is rarely cured save by rubbing the varnish with water and pulverized pumice stone and then revarnishing. The quick, hard drying, and therefore more inelastic finishing varnish, is more susceptible to a cure by washing the surface with clean cold water before the accumulations become too hard, than the elastic one.

To reduce the trouble incident to mud spotting to the lowest possible limit, the carriage painter should study the practices

and customs, so far as possible, of his constituents, and endeavor to anticipate the needs of each individual customer, and to meet those needs. It is quite as much the painter's duty to instruct the carriage owner in the proper way of caring for the paint and varnish applied to the carriage, as it is to know how to apply such materials. And it is generally easier to explain the details of caring for the newly varnished carriage than it is to defend his position, and the quality of his varnish, once the varnish goes wrong. While it is usually cheaper to revarnish the carriage free of cost than to lose a good customer, it is advisable to bear in mind that varnish and labor are the two most expensive commodities consumed in the business of painting and varnishing vehicles.

Upon the carriage that is to go into immediate general service, exposed to all the varied elements of wear and tear, and to road conditions as they are found regardless of the weather, it were better to use a high class, reliable, quick, hard-drying finishing varnish than the elastic one with a pedigree of four generations of international fame back of it. In other words, ascertain the conditions of service to which the vehicle is to be exposed, and use a varnish best adapted to stand up and hold its natural brilliancy against such service. Invariably this will prove the just and satisfactory way to all parties concerned.

Spotting due to soapy or dirty water which may or may not contain a percentage of alkali or acid, may generally be cured if washed with clean water before the spots have long remained upon the surface. Otherwise resurfacing and revarnishing will be necessary. Coal stove and smith forge gases cause dull, greasy spots to appear upon the surface. If noted in time they may be eradicated by washing and if not, revarnishing is the only cure. Some varnishes will spot distinctly under the effect of strong air currents, but as a rule this form of spotting yields readily to the water bath.

ABOUT AMMONIA EFFECTS AND MUD SPOTTING OF NEW VARNISH AND SOME PREVENTIVE MEASURES

The painter located in the small town or village has annoyances to contend with, unknown in a great measure to the city painter.

One of these is the storage and care his work gets when put into service. Not always because room is at a discount, but mostly on account of the "fearful and wonderful" architectural design of his stables and wagon house as he calls it. About 90 per cent. of such people's vehicles either stand outside at the mercy of the elements, or if inside, exposed to all pervading ammonia fumes than which nothing can tend more quickly and surely to the utter destruction, first of the beauty of the varnish, and just as surely, though not quite so quickly, to the disintegration of the whole surface. Added to this kind of abuse is the fact that the vehicle may stand around for days with mud dried hard on it.

It seems of little use to tell the owner that ammonia fumes will surely destroy the whole thing, or that dried-on mud must inevitably spot it. Sometimes the owner thinks he knows at least just as much about varnish as you do, especially if he sells varnish, in which case he pretends to a knowledge of it, though every word he utters about it is only making it proof positive that what he knows of the different brands of varnish is, that he can make so much per cent. more profit on one kind than on another. Probably every carriage ever owned on the place has stood just there, and nobody he has any acquaintance with would think of washing a carriage while the mud was still wet upon it and just after using it. The time to wash it he will tell you is just before using, so that it may look nice and fresh.

Now this is bad enough, yet is only a part of what ignorance and carelessness involves. Some time since I finished the painting of a nice trap. The owner is well fixed, and as I

understood it had a man, though not a professional coachman, to care for his "rigs." The body was finished with Murphy's durable body varnish. For one quart of this I paid \$1.75, or, at the rate of \$7 per gallon. The gear was finished with Valentine's elastic gear varnish. The trap was in my hands quite three weeks after being finished and I washed it twice. Some two weeks after it was put into use by the owner he came to me to complain that it was mud spotted and had deadened. I went at once to see it as he said it was then being washed off. What I saw was amazing; axle grease was freely oozing from the ends of the hubs, and had with both sponge and chamois been fairly plastered over the gear and parts of the body.

There were mud stains on the dash (a wooden one) and I was invited to believe it had been washed off before any mud had had time to dry on it.

I asked to see sponge and chamois, and found just what I expected, axle grease through and through them, and as if axle grease alone was not enough to ruin any nice varnish, the same sponge and chamois had their first innings that day washing greasy harness. The owner wanted me to believe the varnish was to blame. I could only say that I bought the varnish used on the body from him, and also paid an exorbitant price for it.

As for that used on the gear, I referred him to the best people within a radius of many miles who had never had any occasion to find fault with it simply because theirs was properly taken care of, and then found out that his was cared for by any man he could spare occasionally from his coal or lumber yards. Do I revarnish that for nothing? Not much.

I relate this to show what untoward things can happen, and to point a way out of their reach if possible. Of course, if the owners could be made to realize the difference between good and poor carriage varnish, and could be got to take proper care of it, it would be better and more comfortable for the painter to use only the very best that he could buy.

Better, because the work would wear and look nice so much longer, and when repainting time came around again the job would be so much easier to handle. More comfortable, because the best is always the easiest worked and results are so much more certain. I know of but one way to give the painter a fair show when working for such people. Never by any possibility take a chance on giving them a high grade elastic varnish.

Something at about half the cost, hard drying and quick, will stand the abuse heaped on it twice as well, though, of course, it will go to pieces twice as soon, and there's just the possibility that its first appearance to the owner will be more satisfying than the beautiful velvet finish of the durable and high grade article, just as some people prefer a cheap chromo to high art steel engraving. I have always advocated the use of the best to be had, subject, of course, to due limitation in the class of work being done.

Perhaps the better way to express it would be, use the best of its kind, but let the kind be governed by the sort of care it will be likely to get. If one thought it would do any good he might explain to owners that ammonia must certainly ruin any nice varnish, and demonstrate the matter by showing him how ammonia is used in the shop to remove a coat of varnish entirely. In the case of mud spotting, he could invite him to spill some oil on a piece of broadcloth. Afterwards put a plaster of wet mud over the place, let it dry, and expose to a little heat, and it would be found that the mud had drawn the oil from the cloth, in just the same way as the mud drying on the varnish drew the oil out of it and left a mud stain in its place. Capillary attraction is the term used to express what happened, but it will be plainer to us all to just say the dry mud steals the oil, which is the life of the varnish, in just the way I have mentioned, so that spot is dead. Contending with the cheap man who wants just as good as the best, but can't, or won't, afford the care the best must have, is a problem that was, is, and probably ever will be, world without end.

PAINT VALUES

Owing to the turmoil in Europe the value of all colors imported into the United States has advanced, and this has already been felt in higher prices for colors in oil and japan. wood stains and other lines.

In looking at the proposition from the most conservative angle it would seem that jobbers and dealers should avail themselves of the present range of values and stock up at prevailing prices, as there does not seem to be a single ray of hope for lower prices and some reasons exist why they may be higher.

It is well known that jobbers and dealers are buying in a most conservative manner and it is time they came forward with confidence and protected themselves. Don't wait to buy the usual spring stock until some morning a letter arrives bearing the gruesome message, "That owing to the advance in all raw materials, we have been compelled to advance our prices on — mixed paint 10 cents a gallon from this date." It is perfectly easy to find out what products have advanced and how much. Your trade paper tells this or the manufacturer you represent will gladly give you the benefit of his experience.

The whole country is awakening to new life, the railroads have commenced to place big orders, the steel industry has taken on new life and the forecast indicates good business is ahead. It is good business judgment, therefore, to protect one's self against the possibility of higher prices. They will not be any lower and they may be higher.—Paint, Oil and Drug Review.

PAINTING FARM WAGONS

As in all painting the first and most important thing to do when the job arrives in the paint shop is to prepare the surface for the first coat of oil and pigment. The linseed oil coat is best applied before the irons are fitted, as it is then much easier to clean off the grease and soot marks usually left by the smith.

In effacing these marks, use cloths saturated with benzine and wash the surface lightly. This will remove any grease and oil, and if afterwards wiped dry with a clean cloth the surface will appear clean and be ready for the first priming or pigment coat which should be somewhat like the finished shade. Putty all holes and crevices after applying the priming coat and then apply a lead coat as much like the finished shade as possible. The color and varnish coat is next applied after which the striping and finishing may be done, but if an extra coat of color and one of varnish is needed the finishing is done before the last coat of varnish is applied.

Some of the most popular colors for farm wagons are a red running gear with a green body or yellow on the gear with a brown body.

A beautiful brown can be made by mixing five parts of Indian red with one part of Prussian blue and enough yellow added to give it that richness so much desired in the browns.

Right here might be said a word of warning—don't mix your paints hurriedly, as they will not last as they ought to and as they would if more time were taken in the compounding.

SPRAY VARNISHING

But, speaking of varnishing, many enterprising concerns are now spraying varnish upon work instead of putting it on with a brush, and after spraying, the varnished articles are put right into a dry-house and hardened in a very short time. About the same as drying green lumber in 24 hours—you can do it if you know how, and have the lumber exactly as good as though it had been dried in a year by old-fashioned methods.

But you can't dump a lot of lumber helter-skelter into a dry-house, leave it there 24 or 48 hours under all or any conditions, and expect the lumber to come out first class, or even decent.

In order to do the drying stunt in 24 hours, you must be able to control temperature and air blast exactly, also to know just how to send in the heat and air. It requires a whole lot of study and experience, and a mighty good dry-room to do the 24-hour drying trick. But if you know how, you can do it and do it 300 days in the year. So too, you can dry the varnish in a few hours, and dry it better in the dry-room than you can in the usual way. "How?" I can't tell you that any more than I can tell a bookkeeper how to shoe a horse! I can, of course, describe each and every operation, but neither he or you would understand. You both have to be "shown," or else you must both dig out the way, the why and wherefore by tough experience—and some spoiled work. But it can be done, and many concerns are putting in varnish spraying outfits, and before long one will have to go pretty deeply into the back woods to find an old-fashioned hand-varnishing outfit.

From 50 to 75 pounds per square inch of compressed air pressure is used to spray the varnish and to deposit it on the work; and varnish, paint or any other substance put on with compressed air, seems to stick better and to cover more surface than when applied in any other way. It is because of the force with which the substance is forced against the surface—much greater than is possible with a brush.

Get in line, brother smiths, and secure the benefits to be derived from the use of such a speedy and good method of painting and varnishing.—Blacksmith and Wheelwright.

USE OF VERMILION PIGMENT IN INDIA

The valuable scarlet pigment vermilion is much used in India for religious ceremonial and other social customs by the Hindus. A married woman is always marked with it on the forehead. It appears in the emblem of Vishnu on the followers of that deity. It is also used for temple decorations, though not so largely for the latter purpose as by the Chinese, who use it in great profusion for the adornment of their temples and dwelling houses. It is probably owing to this extensive use of it in China that it is so largely manufactured there, and—withstanding the extremely crude method of preparing it—of excellent quality. The Chinaman is somewhat thorough in his methods and will not use adulterated vermilion, contrasting in this with the Hindu, who is often content with a more or less impure pigment.

The apparent apathy of the Indians in securing the profits of an article so largely used by them is probably due to a fear of the difficulties which they suppose to attend its manufacture.

U. S. SHOULD PROTECT AMERICAN TRADE-MARKS

More than an ordinary interest attaches to an interview given out by Assistant Commissioner of Patents James T. Newton, in which he expressed the opinion that strong efforts should be made to bring about a change in the present situation which permits American trademarks to be registered in South American countries for the purpose of preventing American merchants from importing their goods into those countries. Involving the foreign relations of the United States, as the matter does, Commissioner of Patents Ewing said that whatever actual steps were taken would have to be taken through the State Department or through the Pan-American Union.

"There is no doubt that in a number of cases American merchants have been held up by unscrupulous persons in some of the South American countries, and also in some of the countries of Europe, who have registered the American trademarks in their own countries," said Assistant Commissioner Newton. "Under the American law the man who first uses a trademark is entitled to it and to registration of that trademark. In the South American countries and in Germany and some other countries of Europe the first person who registers a trademark

with the officials of those countries is entitled to the trademark.

"You can readily see what an opportunity such a system offers to the unscrupulous. A person in a South American country, having registered the trademark of a well known American brand, can absolutely prevent the importation of those goods into the South American country unless the American merchant is willing to come to terms with him, first paying him a round sum."

WHEEL TAX DECLARED INVALID

As a result of a decision handed down by the Supreme Court in Springfield, Ill., April 22, motorists of Chicago will not be compelled to pay a wheel tax to the municipal authorities hereafter, in addition to a fee for license and registration to the state treasury.

In the test case brought by Joseph Dehner against the City of Lincoln, Ill., the Supreme Court decided that the wheel tax was invalid. Judge Craig, who handed down the decision, held that the annual license fee which motor car owners are required to pay to the state is a tax, and that double taxation exists when motorists are required to pay a municipal tax also. This was the contention of the attorneys of the Lincoln resident, who sought to have the city ordinance there declared unconstitutional.

The decision of the Supreme Court struck the city of Chicago a terrific financial blow; it means that Chicago is to be deprived of at least two-thirds of an annual income which reached \$726,129 for 1914, and which has been climbing so steadily, it was expected to reach the \$1,000,000 mark within a short time. During the last five years, Chicago has collected \$3,146,218.88, from this source of revenue, divided as follows: 1910, \$560,213.03; 1911, \$586,157.46; 1912, \$596,757.87; 1913, \$676,961.47; 1914, \$726,129.05.

The opinion applies to passenger vehicles alone, and does not declare invalid the state wheel tax law. Motor trucks, and horse-drawn vehicles are not mentioned in the decision, and apparently are not affected. Dehner refused to pay a wheel tax imposed by the ordinance, and was fined \$25 by a local justice of the peace. The Circuit Court reversed the decision. The case was then taken to the Supreme Court and the action of the lower tribunal was sustained.

In sustaining the action of the lower court, however, the Supreme Court says: "The ordinance in question is in square conflict with Section 12 of Motor Vehicle Act of 1911, which prohibits the imposition of local licenses on vehicles of certain types. The ordinance in question is against both spirit and letter of the law."

As the result of this decision, Chicago will be deprived of more than \$500,000 annual revenue, which has been used to pay the expenses of street repairs, and hundreds of men will be thrown out of work in the street repair department until provision can be found for an appropriation to carry on this work. City officials believe that Chicago has received a knock-out blow as the result of the Supreme Court decision on the wheel tax law.

FORD ASSEMBLING PLANT FOR MILWAUKEE

An automobile assembling plant costing \$300,000, employing from 400 to 500 men, and with an annual payroll of at least \$600,000, is contemplated in Milwaukee by the Ford Motor Co., Detroit, which has operated a small plant of this character in Milwaukee for two years in leased quarters. The Common Council is engaged in removing statutory restrictions interfering with the establishment of this plant on a selected site. According to A. W. L. Gilpin, manager of the Milwaukee branch of the Ford company, plans for the proposed factory call for a seven-story reinforced concrete and brick building, 160 x 330 feet, with an annual capacity of 18,000 to 20,000 cars. This number will just about suffice to supply Wisconsin.

Wood-Working Shop

SCIENTIFIC KILN-DRYING OF LUMBER TO PREVENT WASTE*

The present practice of kiln drying varies greatly and there is no uniformity or standard method. Temperatures vary anywhere from 65 to 165 deg. F., or even higher, and inch stuff three to six months on the sticks is being dried in from four days to three weeks, and 3 inch stuff in from two to five months. Many kilns make a hit at superficial points and fall down on the fundamentals.

Methods of Drying and Types of Kilns

All methods in use at atmospheric pressure may be classified under the following headings. The kilns may be either progressive or compartment, and preliminary steaming may or may not accompany any one of these methods:

1. Dry air. Generally obsolete.
2. Moist air.
 - a. Ventilated.
 - b. Forced draft.
 - c. Condensing.
 - d. Humidity regulated.
 - e. Oven or boiling.
3. Superheated steam.

Losses Due to Poor Drying

In some cases there is practically no loss, but more often it ranges from 1 to 3 per cent., and 7 to 10 in refractory woods, such as gum. In some cases, the losses are as high as 33 per cent. Air drying is by no means always to be preferred, as there is little or no control over the process; it may take place too rapidly some days and too slowly others; it may be very irregular. Hardwoods in large sizes almost invariably check, but by proper kiln drying these unfavorable circumstances may be eliminated. Air drying is, however, unquestionably to be preferred to bad kiln drying, and when there is any doubt in the case it is generally safer to trust to the former. Green lumber can be better dried in the kiln if the fundamental principles are all taken care of.

Proper Kiln Drying vs. Air Drying

Some of the advantages of kiln drying to be secured over air drying in addition to reduction of shipping weight and lessening quantity of stock are the following: Less material lost; better quality of product; prevention of sap stain; fixation of gums and resins; reduction of water absorption.

Experiments have shown that drying oak and ash at 145 to 170 deg. F. has reduced the water absorption 15 to 25 per cent. Specimens from the same sticks were both air dried and kiln dried, then placed side by side on a rack for over a year, and their moisture contents then determined. This reduction in moisture means a reduction in the "working" of the materials which, even though slight, is of great importance.

Fundamental Principles of Drying of Wood

1. Evaporation from the surface of a stick should not exceed the rate at which moisture passes from the interior to the surface.
2. Moisture tends to pass from the hot toward the cold portions.
3. Wood is soft and plastic while hot and moist, and will become set in whatever shape it is in as it dries.
4. Shrinkage is greater the higher the temperature of drying while still moist.

*From an address before the Northern Hemlock and Hardwood Manufacturers' Association.

5. Case hardening and honey combing result from the two foregoing circumstances. It may be explained thus: Suppose a block of wood is very wet and is placed in at too high a temperature, and too low a humidity. The surface begins to dry and tends to shrink, but is prevented from doing so by the wet interior. Being plastic, it yields to this resistance and becomes stretched, and if not plastic it will check open. As drying proceeds, it becomes hard and set in this expanded condition and acts as a strong shell. The interior now dries very slowly, does not become set but shrinks, and as the exterior is already hard, it opens up into honey combing. When the exterior once becomes set, or case hardened, the interior is almost certain to become honey combed, whether the drying takes place in the kiln or a long time afterward, and the only remedy is to moisten the exterior by steaming or soaking it before it is too late. Air-dried, as well as kiln-dried, material frequently case hardens and honey combs.

6. Drying should take place uniformly at all points, otherwise stresses are set up in the wood.

7. Brittleness is produced by drying too far.

8. Dried wood absorbs or loses moisture in proportion to the relative moisture in the air.

9. Water absorption and working are reduced by thorough drying but not eliminated.

How to Utilize These Factors

To utilize these principles properly in drying, attention should be given to the following factors:

1. The lumber should be heated clear through before drying begins.
2. Humidity should be correct at the start and reduced in the proper ratio as the drying progresses.
3. The temperature of the lumber should be uniform and as high as the kind of material will endure.
4. The rate of drying should be controlled by the amount of humidity in the air and not by the rate of circulation. The circulation should be ample at all points to supply the heat needed for vaporization and to keep the humidity uniform. To evaporate one pound of water at atmospheric pressure requires the amount of heat given up by 69,000 cubic feet of dry air in falling 1 deg. F. The regulation of the humidity is to prevent the surface from drying down to the point where it takes a "set" before the interior has dried to nearly the same amount, thus prevent case hardening. If dried too rapidly, case hardening will result.
5. The degree of dryness obtained should conform with the use to which the wood is to be put.

Ideal drying depends upon ample circulation, control of humidity at all times, and proper temperature. Any kiln which fulfills these conditions should be capable of giving perfect drying.

PREVENTING WASTE IN WOODWORKING PLANTS

Some interesting facts and figures regarding the cutting of wood stock and the losses due to poor drying are given by C. F. Grove in the Wood-Worker, and should be of value to those who have such stock in large quantities.

A few figures on the cutting of stock may be given, although they may be like tooth pulling, painful but necessary. A concrete case: Four men are cutting stock; each cuts from 3,000 to 5,000 feet per day; they receive probably \$2.50 to \$3 per day each. The stock they are cutting will be worth, say, \$25 per

thousand, hence the following equation: 4 men \times 5,000 feet \times \$25 = \$500.

This \$500 represents the value of the stock that is daily being cut by these four men, at a labor cost of \$10 or \$12. The necessary, or rather unavoidable, waste may be 15 per cent., or 3,000 feet, costing \$75; this we cannot help, and it is no doubt covered in the cost sheets.

Now, suppose some of the cutters are careless or do not use their heads, or do not know how to get the most out of a board. Given any or all of the above conditions, and the waste will very readily jump to 25 per cent. In fact, it is much easier to let it jump to 25 than it is to keep it down to 15 per cent., and the extra 10 per cent. waste will cost just \$50 per day.

A lot of stock cutters, and good ones, too, can be hired for less than the loss that one poor one will make. The labor cost is so small, compared to the value of the stock that may be saved, that it cannot be profitable to employ a man of poor judgment in the capacity of stock cutter. Men of good judgment usually command good wages, but in this position they have a most excellent chance to earn them. In fact, I do not believe there is another machine in the average wood-working shop where money may be so easily saved or lost as at the stock saw.

System to Avoid End Trimming Waste

The amount cut off in squaring the ends of stock may well be watched. Most lumber nowadays is trimmed at the mill, and, barring bad checks, 1 inch should square the first end. The length of the board and the stock lengths will probably conflict to the extent of 3 or 4 inches waste on the last end. Take a total waste of 4 inches as an average. This equals, on a 1 \times 8 inch 12 foot board, 3 per cent., and this amount may be said to be legitimate end waste. How easy it is to waste an additional 4 inches on the two ends thus bringing the total waste up to 6 per cent. at the start.

One concern known to the writer has adopted a sorting system in its yards, whereby all stock is sorted with the best end one way; it comes to the cutters best end first, and a very light cut is taken off this good end. This concern cuts about 40,000 feet per day, mostly No. 2 common hardwood, into short lengths, and thinks this end sorting pays. It certainly seems reasonable that the longest waste end should be on the poorest end of the board.

Savings in Low Grade Stock

In cutting low grade stock many short-length cuttings can be saved that will be worth just as much as the same cutting out of lumber that cost \$10 per thousand more. I have before me a report from one cutting department which shows that during the 60 days from November 29 to January 29, 23,680 feet of clear cuttings, from 14 to 29 inches long, were saved out of a low grade hardwood used for crating. The crating is worth \$14 per thousand and the cuttings saved, \$22 per thousand. This, therefore, indicates a saving of over \$90 per month.

U. S. CONDUCTS WOOD-WASTE EXCHANGE

Manufacturers Decrease Costs and Increase Profits by Utilizing Each Other's Scrap Material

The latest business-aid service instituted by the government is a wood-waste exchange. It enables lumbermen and manufacturers in the various wood-using industries to utilize each other's waste to mutual advantage, aiming to effect a large saving in forest material as well as in money.

The wood-waste exchange is being conducted by the forest service of the Department of Agriculture. More than 40 manufacturers of wooden articles already have asked to be listed as having certain kinds of waste wood for sale, or as desiring to obtain their raw material in the rough or in semi-finished form from mill or factory waste.

Twice a month the exchange sends out a circular headed "Opportunities to Buy Waste," containing the names and addresses of factories having waste wood for sale, with exact information as to species, sizes, forms and quantities. Similarly, another circular headed "Opportunities to Sell Waste," gives the specific requirements of wood-using plants which desire to buy waste material.

One of the first waste problems solved has been that of a furniture maker in Michigan who wrote to the forest service asking how to dispose of sugar maple blocks and sticks which were cut off in the process of furniture making and which he had to sell merely as fuel. Samples were obtained from him and the forest service then located a scrubbing brush manufacturer who used small maple blocks for brush backs. The result was that the furniture maker was enabled to sell his waste at a much higher price than it had brought as firewood, while the brush maker was enabled to buy brush-back material in suitable sizes at a much lower figure than it had been costing him to buy maple lumber and cut it up.

Firms which have been put into touch with each other through the exchange are expected to notify the forest service when their requirements have been met; then their names are removed from the lists. In this way several concerns which early took advantage of the plan have dropped off the lists; but as more and more manufacturers learn of the wood-waste exchange the lists are steadily growing.

STANDARDIZING THE NAMES OF WOODS

The matter of the standardization of the names of woods, which should be of great interest to all lumbermen and to manufacturers using timber and forest products, is being taken up by the Office of Industrial Research, Forest Service.

According to the present plan, the office will work in co-operation with the various lumber associations to accomplish the standardization plan. The associations will be asked by the office to furnish the names, local and national, of the woods found within their territory.

When these facts have been assembled the office will tabulate, and at some later time have a meeting of lumbermen to decide on the best plan for naming the woods. It has been pointed out that such standardization would be of the greatest benefit to lumbermen in filling contracts, etc.

This work has already been commenced and is going ahead in connection with the co-operative lumber investigation being carried on by the Forest Service and the Department of Commerce.

SHIFT IN THE SCENES IN THE SPOKE TRADE

Changes come to all branches of the hardwood business from time to time, but no other branch of it reflects at present so radical a shift in the scenes as the spoke branch of the trade, especially in the manufacture and sale of hickory spokes. The shift is due to the introduction and rapid development of the automobile and the motor truck. These call for spokes in enormous quantities, but the call is entirely different and has been the means of replacing what was formerly the cream of the hickory spoke trade.

This was set forth in a plaint made recently by a prominent manufacturer who has been identified with the spoke business all his life. He said that the automobile business had ruined the finer spoke trade, which was the manufacture of hickory spokes used in the high-priced buggies and carriages of the older days, and to which the spoke manufacturer looked for his main profits. This change might not seem to make much difference since the automobile calls for a larger quantity than has been lost in the fine carriage and buggy spoke trade, but the spoke man complains that there is no money in the auto spoke trade, that it is handled on the same close margin of the low grade and cheap buggy spokes and wagon spokes of olden times. He contends further that the same high quality

of hickory stock is not insisted upon. The automobile manufacturers are close calculators and shrewd buyers, and because of the large quantity used they insist on narrow margins, with a final result that this branch of the spoke business today is very unsatisfactory from a profit-yielding standpoint.

Meantime it has replaced that old trade in fine spokes and shafts that made the best profit and has brought home the realization that the spoke men never made enough profit on the lower-priced goods. So far as quantity is concerned, the spoke trade is as big today as it ever was, perhaps bigger.

It is a mistake to depend on the highest grade product for all the profits. Every grade and specification of mill products should pay its own fair profit. Then the shifting from one to another will not so disturb the balances of those engaged in the trade.—Hardwood Record.

WOOD WORK IN GENERAL AND WHEEL WORK IN PARTICULAR

Wood work generally gets a pretty rough going over in the smith shop and it seems to me that a good plan to follow: For instance, on a wood part for a wagon or buggy to be duplicated, would be to round the part and finish it as near like it was at the factory as possible. The factory makes finish a study in order to sell their product against competition. We have seen wood pieces, turned supposedly to duplicate factory parts, that were very much lacking in finish. Observation and good reasoning would teach us much, but our conceit and seeming satisfaction of doing things different than the other fellow has us standing in our own light and thus hindering our progress. When we go to the shoe store to buy a pair of shoes we expect them to match up, and if they don't, it's pretty sure you will not make a deal with the shoe man, for he is trying to "hand you something." So let us be careful what we are trying to hand our customers.

In putting felloes on narrow tread wheels, says M. W. Abts, in American Blacksmith we use the rough stock. Our main reason for doing this is that the finished felloes seldom have the proper curve to fit the wheel for which they are intended. Should you put them on, when the job is done the wheel will be slightly six or seven sided, as the case may be. If trimmed down till round you rob the felloe of its stock near the joins. In using the rough felloes we make a pattern of the inside circle of the felloe, saw the same with hand saw and then after being placed on wheel, we plane it down and round it out. Now turn wheel over on wheel horse, mark circle to where it is to cut off—which we do with the band saw—then go back to wheel horse, plane down to the desired width, round out and the job is done—with not only a workmanlike appearance but serviceable also. You have almost a perfect circle and the tread is correct.

A FORCEFUL GATHERING

Chicago will be the scene of the eleventh annual convention of the Associated Advertising Clubs of the World which meets June 20 to 24. This great gathering of the dynamos of the business world to discuss common problems and to advance the banner of truth in advertising promises to hold a unique place in the events of the year.

President Wilson, war conditions permitting, will head the list of speakers. Hon. William Jennings Bryan, John H. Fahey, president of the Chamber of Commerce of the United States; Henry Watterson, George Horace Lorimer, editor of the Saturday Evening Post, and Arthur Brisbane are among others of national prominence who are to address the sessions. On the Sunday preceding the formal opening of the convention, 50 business men of country-wide reputation will deliver lay sermons in Chicago churches.

New features include a conference of the teachers of advertising and another of the secretaries of advertising clubs. Departmental meetings of men in the several fields of work

give opportunity for a discussion of the problems of various phases of advertising, an arrangement which reflects the new freedom in business.

Amusements include a list of social functions for the ladies, a gridiron show to be staged by 150 Chicago men, lake and automobile trips. At present, a whirlwind campaign is being waged by advertising clubs in an effort to mobilize in Chicago at full war strength.

MEETING OF THE CARRIAGE MAKERS' CLUB

The April meeting of the Cincinnati Carriage Makers' Club was held at the Business Men's Club the evening of April 8, President W. J. Brunsman presiding.

The speaker of the evening was I. L. Ritchie, attorney for the Credit Men's Association, of Cincinnati. Mr. Ritchie spoke very interestingly on work of this association, explaining in detail how this association assists the leading mercantile agency in keeping its records up to date. The local association has a total membership of 350 and the national organization a total of 20,000. He further urged and invited members of the club to join, stating that they would derive great benefits.

H. T. Piper, of the Zanesville Gear Wood Co., Zanesville, O., was elected to membership, and the transfer of membership of James Bradley to Wm. H. Mistler was approved.

Clen Perrine, in taking the chair, thanked the members for electing him their president, stating that he has spent his whole life in the carriage industry and considered it a very high honor to be president of the Carriage Makers' Club, and he hoped that all members would do their utmost in helping him to increase the membership and that they give him their hearty support and co-operation in furthering the interest of the club.

Vice-president Chas. A. Fisher, Treasurer E. E. Hess and Secretary C. J. Rennekamp all thanked the members for the honor bestowed upon them and all promised to work hard to further the interests of the club, feeling assured that they could rely on the support of their fellow members.

A motion was made by Theo. Luth and fully seconded to authorize the treasurer to set aside a sum not to exceed \$300 for the use of the Freight and Classification Committee. This money is to be used in employing counsel to present a petition to the Interstate Commerce Commission regarding rate discrimination. Theo. Luth stated the carriage factories of this city have also contributed about \$400 to this cause. The treasurer was instructed to set aside this fund.

President Perrine appointed the following standing committees:

Entertainment—Harry Roettinger, chairman; Jos. Wallenstein, P. P. Hunter, G. W. Huston, C. F. Egolf.

Press—A. S. Brown, chairman; J. Frank Hutcheson, C. J. Rennekamp.

Freight and Classification—E. M. Galbraith, chairman; Theo. Luth, C. W. Shipley, W. A. Sayers.

Membership—M. J. McNamara, chairman; Ralph Rowalt, P. P. Hunter, C. W. Steele, Chas. A. Fisher, Fred T. Luth, Milt. Wieman.

Technical School—W. A. Sayers, chairman; H. W. Meyer, Frank Knablaugh, John R. Linneman, C. W. Steele.

Insurance—Geo. S. Brown, chairman; Theo. Luth, Harry Pollock, W. J. Brunsman, M. J. McNamara.

Labor—Otto Armleder, chairman; E. V. Overman, H. H. Nelson.

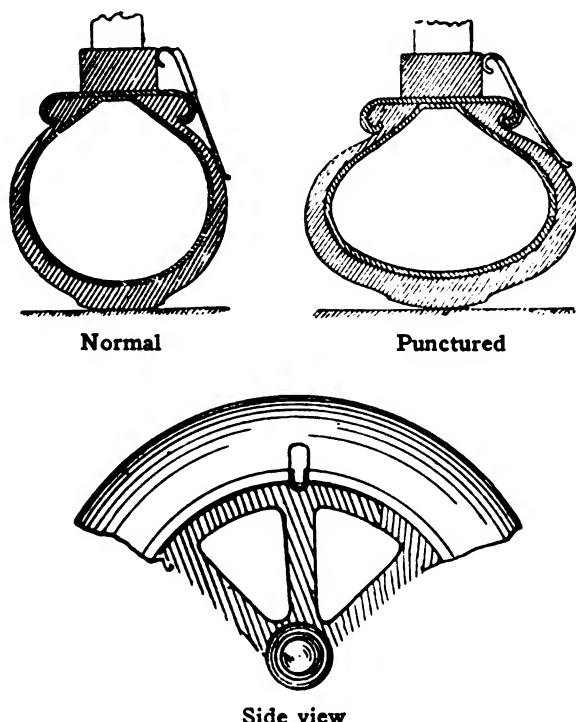
Good Roads—O. E. Walker, chairman; P. P. Hunter, Emil E. Hess.

Theo. Luth and Perrin P. Hunter urged members of the club who were not members of the C. B. N. A. to join the national organization, pointing out the advantageous features.

A motion was made by Perrin P. Hunter and seconded that a committee be appointed to go into the question of the Dixie highway routing, after which the meeting adjourned.

A NEW INVENTION FOR INDICATING TIRE PUNCTURES

The accompanying illustrations show the construction and method of attachment of an invention patented by H. S. Christopherson, of Rolfe, Pa. The device is designed for the purpose of indicating by means of a signal the puncture or deflation of pneumatic tires on automobiles. The device is called the Tire Cri-Cri and consists of a metal tongue fastened in a



slide the inside ends of which are bent into hooks, or grips, intended to grip the rim of the wheel, which is clearly shown in the illustration. The tongue is thus brought against the side of the tire and if the tire leaks, or is punctured, the device operates as shown and the sound produced is a sure signal, which the inventor claims will result in economy of tire expense, for the reason that motorists will be warned instantly the tires become deflated to any extent.

REORGANIZATION OF HALE BUGGY CO.

At a conference held in Anniston, Ala., recently, the reorganization of the Hale Buggy Company was completed, and the plant will resume operations within the next 30 days under the control of the Hale Buggy Mfg. Co., which will have an authorized capital of \$50,000, with \$45,000 of that amount subscribed and paid into the treasury.

J. A. Evans and J. W. Gresham, of Griffin, Ga., where they are now operating a large buggy factory, will be the active men behind the Anniston enterprise. Mr. Evans will be president of the company; Mr. Gresham, vice-president; W. H. Weatherly, secretary, and James Keith, Jr., treasurer. The gentlemen, together with T. E. Kilby, will constitute the board of directors.

The reorganized company is much stronger financially than the old company, and with the longer experience of the present owners of the Hale plant, it is believed will very likely prove more successful than in the past. The Griffin gentlemen are very largely connected with the business affairs of that city, Mr. Gresham being president of the Griffin Board of Trade. They will divide their time between Anniston and Griffin, the plant to be operated by an experienced superintendent.

HORSE SHOWS IN 1915

East Orange, N. J.....	April 7
Riding Club, New York.....	April 8
Brooklyn, N. Y.....	April 14-17
New York (Durland's).....	April 19-21
Philadelphia Indoor Show.....	April 22-24
Washington, D. C.....	May 8-13
Devon, Pa.....	May 27-31
Greenwich, Conn.....	May 29
Tuxedo, N. Y.....	June 4-5
Leesburg, Va.....	June 9-10
Fall River, Mass.....	June 10
Upperville, Va.....	June 16-17
Culpeper, Va.....	July 5-6
Charlottesville, Va.....	July 14-15
Orange, Va.....	July 21-22
Manassas, Va.....	July 28-29
Long Branch, N. Y.....	July 28-31
Front Royal, Va.....	August 4-5
Berryville, Va.....	August 11-12
Charlestown, W. Va.....	August 18-19
Warrenton, Va.....	August 31, September 4
Rutland, Vt.....	September 6-10
Indianapolis, Ind.....	September 6-10
Hamline, Minn.....	September 6-10
Newport, R. I.....	September 6-8
Hartford, Conn.....	September 9-11
Orangeburg, N. Y.....	September 8
Detroit, Mich.....	September 6-11
Wilmington, Del.....	September 8-10
Syracuse, N. Y.....	September 13-18
White Plains, N. Y.....	September 14-18
White River Junction, Vt.....	September 14-17
Ogdensburg, N. Y.....	September 20-24
Mineola, N. Y.....	September 22-25
Nashville, Tenn.....	September 20-25
Brockton, Mass.....	October 5-8
Chicago, Ill.....	November 29, December 4

COLUMBUS BUGGY CO. SOLD OUT AT AUCTION

The New Columbus (O.) Buggy Co., successor to the old Columbus Buggy Co., which went into the hands of a receiver more than a year ago, has decided to quit business almost entirely and the property will be converted into a power building for the use of small manufacturers. The company will continue to market and sell the parts of the several makes of automobiles which it has been producing, and the machine shop where these parts have been produced will be retained. Neither automobile or buggies will be manufactured hereafter.

Practically all of the business was turned over to a firm of auctioneers who catalogued it and sold it on May 12 and 13. This included all the equipment and raw material on hand, including finished vehicles.

The company headed by Mr. Finnegan will retain all the real estate holdings.

PUBLISHER'S STATEMENT

Statement of the ownership, management, etc., required by the Act of August 24, 1912, of The Hub, published monthly at New York, N. Y., for April 1, 1915.

Editor: G. A. Tanner, 24 Murray St., New York City.

Managing Editor: none.

Business Manager: G. A. Tanner, 24 Murray St., New York City.

Publisher: Trade News Publishing Co., 24 Murray St., New York City.

Owners: (If a corporation, give its name and the names and addresses of stockholders holding 1 per cent. or more of total amount of stock).

Trade News Publishing Co., 24 Murray St., New York City.

Joseph H. Wright, Tom's River, N. J.

G. A. Tanner, 24 Murray St., New York City.

Geo. W. Hills, Fairfield, Conn.

Known bondholders, mortgagees, and other security holders, holding 1 per cent. or more of total amount of bonds, mortgages, or other securities: None.

TRADE NEWS PUBLISHING CO.

G. A. Tanner, Sec'y and Treas.
Sworn to and subscribed before me this 1st day of April, 1915.

JOSEPH R. FRITH,

Notary Public Kings County. Certificate filed in N. Y. County.
(My commission expires March 30, 1916.)

C. B. N. A. CONVENTION ANNOUNCEMENT

The following notice has been sent out by Secretary Henry C. McLearn, of the C. B. N. A.:

The forty-third convention and exhibition of the Carriage Builders' National Association will be held in Cleveland, O., from September 20 to 24, 1915.

The exhibition from September 20 to 24, inclusive.

The convention, September 21, 22 and 23.

Both the exhibition and convention will be held in the Central Armory, Sixth street and St. Clair avenue.

The committee expects to arrange for the meetings in such a manner and with such subjects that the whole carriage trade will be both instructed and benefited. We expect this to be one of the very best of our conventions.

You are earnestly requested to arrange to be present; you will surely be repaid for your time and expense.

By order of the executive committee.

HENRY C. McLEARN, Secretary.

ENLARGING FRANKLIN PLANT

H. H. Franklin Mfg. Co., Syracuse, N. Y., has begun the construction of an addition 53 feet wide, 100 feet long, three stories and basement, which will be devoted exclusively to the manufacture of die castings. The die casting department of the company is now located in the main building on Geddes street, and as soon as the new building is ready, it will be removed to give space for the manufacture of automobiles. The new structure will be of fireproof construction—steel, concrete and brick being used. The first floor will have an office, where all the business of the casting industry will be handled, and a tool making shop. The second floor will be used for packing, cleaning and shipping, and the foundry will be on the third floor. A storeroom for raw materials and the vault for dies will be in the basement. The addition will provide for doubling the output of the die casting department. Employment is now given to about 100 men on die castings alone.

ADDS BOB-SLEDS TO LINE

The Turnbull Wagon Co., of Defiance, O., has added a full line of bob-sleds to its line of wagons. The company promises that these goods will be constructed in a first-class manner, in keeping with the Turnbull quality. The sleds will be made of thoroughly seasoned white oak throughout, all hand painted and varnished with the same quality Dutch Boy red lead and Glidden varnish that is put on the old reliable Turnbull wagons "made with piano finish." Manager Colt writes that he expects to have these sleighs ready for fall season, and dealers who are interested would do well to secure agency contracts early.

PHILADELPHIA CARRIAGE AND WAGON BUILDERS

The regular monthly meeting of the Carriage and Wagon Builders' Association of Philadelphia was held at the Hotel Hanover, Twelfth and Arch streets, on Friday evening, April 16, with President William P. Hansell in the chair. There was an excellent attendance at the meeting, and much routine business was transacted. After the business of the evening had been completed the members adjourned to the dining room of the hotel, where the usual tasty and abundant lunch was served.

A NEW BOOK BY FRED'K SCOTT-MITCHELL

The Trade Papers Publishing Co., London, Eng., have just brought out a book entitled, "Practical Gilding, Bronzing, Lacquering and Glass Embossing." The author of the work is Fred'k Scott-Mitchell, a man who has had years of practical

experience, and his book is in the interest of his fellow craftsmen.

All branches of leaf and powder gilding, silvering, bronzing, and lacquering have been included in this book and the contents are essentially practical. Many illustrations and samples are included and the book is altogether a work of merit that should prove of value to the trade. The price of the book is 75 cents.

C. H. A. T. CONVENTION DATES

At the call of President G. A. Tanner, a special meeting of the board of directors of the Carriage, Harness and Accessory Traveling Salesmen's Association was held at the Grand Hotel, Thirty-first street and Broadway, New York, at 8 p. m., Tuesday, April 13, 1915. It was voted to hold the twenty-fifth annual convention at Cleveland, O., at the time of, and in conjunction with, the annual meeting of the Carriage Builders' National Association, September 20-25, 1915. A committee was appointed to make all arrangements for the convention, entertainment, etc.

B. F. GOODRICH CO. BUILDS \$500,000 ADDITION

The B. F. Goodrich Co., Akron, O., has decided to build during the coming summer an addition to its plant which will cost in the neighborhood of \$500,000, according to E. C. Shaw, vice-president and general manager of the company's business. The plant is to be erected on a strip of land on the canal in Akron, which was recently acquired by the company from the state. The enormous business which the Goodrich people have received as a direct result of the war in Europe is the principal reason for the expansion indicated by the proposed addition.

NEW CONCERN TO RETAIL VEHICLES

The Henderson Wagon & Buggy Co., of Hendersonville, N. C., has been incorporated with a paid in capital of \$5,000 and \$25,000 authorized. The new company will handle buggies, wagons, harness, automobiles and general supplies for vehicles. The company assumes the vehicle and harness portion of the business heretofore conducted by the Farmers' Hardware & Supply Co., and the Old Hendersonville Buggy & Wagon Co. The officers of the concern are as follows: D. S. Pace, president; W. A. Keith, vice-president, and George Sloan, secretary and treasurer.

RELIANCE BUGGY CO. ELECTS OFFICERS

The annual meetings of the directors and stockholders of the Reliance Buggy Co., of St. Louis, Mo., was held in that city on April 6. The following officers and directors were elected: J. C. Duke, president; P. E. Ebrenz, vice-president and manager; F. W. Edlin, secretary and treasurer; William Butterworth, W. L. Velie, S. H. Velie, C. D. Velie, Floy N. Todd and A. T. Stevens, directors.

GERMAN ARMY HARNESS SHORTAGE IN EAST PRUSSIA

According to the German trade paper, Der Ledermarkt, there is a shortage of harness for the army in East Prussia. As most hides in Germany have been commandeered by the government, the East Prussian army department has sent a request to the Company for Distribution of Hides to give 30,000 free for the manufacture of harness leather.

DU PONT COMPANY MOVES N. Y. OFFICE

The Du Pont Fabrikoid Co., Inc., announces the removal of its New York sales office from 90 West street to the Equitable Building, 120 Broadway, April 17.

Trade News From Near and Far

BUSINESS CHANGES

Campbell Bros. have purchased the vehicle, implement and hardware business of Geit & Son, at Bowling Green, O.

W. R. Woodson has disposed of his implement, hardware and vehicle stock at Providence, Ky., to C. K. Holland.

Gustav Goetsch, of New Ulm, Minn., has sold his wagon business and shop to Wenzel J. Konkal, of Shakopee, Minn., and Joseph Witt. The new firm will be known as Witt & Konkal.

Hussey & Hussey have disposed of their hardware, implement and vehicle business at Zionsville, Ind., to W. E. Eikenberry, of Russiaville, Ind., who will add it to the chain of stores of this kind that he operates in northern Indiana.

A. G. Smith has bought the vehicle and implement business and stock of the Star Implement Co., Fargo, N. D. The name will be changed to Smith Auto Co., and the new firm has added a line of Chevrolet cars.

NEW FIRMS AND INCORPORATIONS

M. L. Chancellor has engaged in the vehicle business at New Franklin, Mo.

Dalbey & Gentry have engaged in the vehicle business at Braymer, Mo.

Markley & Stein will engage in the vehicle and implement business at Estherville, Ia.

The Henderson (N. C.) Buggy & Wagon Co. has been incorporated. Capital \$25,000.

J. G. Gilpin will engage in the manufacture of wagons and buggies at Princeton, W. Va.

Bauercamper & Turner have engaged in the implement, hardware and vehicle business at Chesterton, Md.

The Citizens' Mercantile Co. has been organized by C. Z. Saunders at Edison, Ga., to retail vehicles and implements.

The Pearce & Coe Hardware Co., recently organized at Penn Yan, N. Y., with a capital of \$10,000, will deal in wagons, harness, etc.

The General Supply Co., organized at Owensboro, Ky., will carry a full line of vehicles, gasoline engines and cream separators. The company will also handle a line of implements at an early date.

Chattanooga, Tenn., has a new industry, the Dixie Tire Mfg. Co., with a capital of \$25,000. H. A. Phillips, formerly sales manager of the Ten Broeck Tire Co., Louisville, Ky., is the manager of the new concern.

FIRES

Fire in the plant of the Premier Motor Mfg. Co., Indianapolis, Ind., April 24, caused a loss of \$50,000.

The carriage factory and blacksmith shop of L. R. Speck, Welsh Run, Green Castle, Pa., was entirely destroyed by fire on April 7, with a loss of several thousand dollars. Plans for rebuilding have not yet been formulated.

Fire destroyed a portion of the plant of the York Wagon Gear Co., York, Pa., engaged in the manufacture of wagon and automobile bodies, entailing a loss of \$10,000. The fire originated in the drafting room and many valuable patterns were destroyed.

The Western Wheel Works, a part of the Banner Buggy Co.'s plant in St. Louis, Mo., was damaged by fire to the extent of \$75,000 on April 7. The fire did not discommode the work

in the least, as Russell E. Gardner and his co-workers had prepared for any emergency which might occur.

The carriage shop, machine works and numerous vehicles of the B. C. Bristow Co., carriage manufacturers, Richmond, Va., were destroyed by fire April 23, the three-story building being practically gutted. The loss was estimated at between \$35,000 and \$40,000, with about \$9,000 insurance on the stock. New stock valued at \$5,000 was placed in the storage rooms of the factory only the week previous, and all of it was destroyed.

NEWS OF THE TRADE

The Detroit Body Co. filed a petition in bankruptcy. Liabilities, \$329,650.17; assets, \$422,391.13.

The Backstay Machine & Leather Co., Union City, Ind., has increased its capital stock from \$120,000 to \$160,000.

The Jitney Automobile Co., 701 Audubon Building, New Orleans, La., will equip a plant for the manufacture of motor cars.

An addition, 30 x 78 feet, two stories, is to be made to the carriage and wagon works of C. J. Handel, Myrtle and Chicago streets, Buffalo.

The F. S. Carr Co., of Boston, which manufactures waterproof materials for automobile tops, has opened a branch in Detroit, at 971 Woodward avenue.

The Harvey Spring & Forging Co., Racine, Wis., has developed a new type of bolster spring for heavy duty vehicles and is now manufacturing it for the market.

The Kirk-Latney Mfg. Co., Cleveland, O., manufacturer of bolts, rivets, juvenile vehicles, etc., has enlarged its plant by the addition of a warehouse, 50 x 200 feet.

It is reported that the Cruse-Crawford Mfg. Co., Birmingham, Ala., will establish a plant for the manufacture of automobile tops and wagon and buggy bodies.

Sales of new vehicles have been approximately even with those of last season, according to Fred O. Nuetzel, president of the Ruby Carriage Co., Louisville, Ky.

The Limousine Top Co., Kalamazoo, Mich., has been incorporated with a capital stock of \$25,000 and will manufacture a line of vehicles, automobile tops and accessories.

The National Screw & Tack Co., Cleveland, O., will shortly enlarge its plant by the erection of a one-story machine shop. Some additional equipment will probably be required.

The Kelsey Wheel Co., Detroit, manufacturer of automobile wheels, has taken out a building permit covering the erection of a one-story factory, 90 x 313 feet, to cost \$50,000.

The Matthews Carriage & Auto Co., of Des Moines, Ia., is now located in the Hawkeye Transfer Building, with office and display space on the first floor. J. H. Matthews is manager.

The Fisher Vehicle, Woodstock & Lumber Co., Erin, Ark., has been incorporated with a capital stock of \$15,000, by A. B. and E. G. Fisher and C. N. Garanfio, and will equip a wood-working plant.

Schmidt & Stork, manufacturers of farm wagons and vehicles, West Bend, Wis., are buying a small lot of machinery and equipment. A multiple spindle boring mill has been purchased from the Wayne Machine Co., Wayne, Ind.

The Auto Tire Armor Co., Mt. Clemens, Mich., has been incorporated with \$10,000 capital stock, to manufacture automobile tires. A factory has been purchased and equipment will be installed at once. Jay Baldwin and A. A. Bennett are the principal stockholders.

The Corydon Wagon Factory, owned and operated by the

Keller Mfg. Co., of Corydon, Ind., broke all previous records during March when the company made and shipped 1,324 wagons. In February the output consisted of 1,316 wagons. The plant has been in operation at Corydon for about 15 years.

An annual meeting of the Lake Charles Carriage and Implement Co., Lake Charles, La., was held in the place on April 6. Frank Caffall, of Jennings, was reelected president and W. E. Patterson, of Lake Charles, was reelected secretary and manager of the concern. A prosperous year's business was reported.

The Gramm-Bernstein Motor Truck Co., Lima, O., has taken an order for 240 3½-ton motor trucks for delivery during the next 12 months. The company now has on hand orders for 60 trucks per month, or the total capacity of the plant working night and day. It has two factory additions under way.

The Four Wheel Drive Automobile Co., Clintonville, Wis., which recently booked a \$600,000 order for motor trucks for the British government, is reported to have been given additional orders by the same purchaser amounting to a similar figure. Considerable equipment has been purchased and all needs are not yet satisfied.

NEWS OF THE TIRE TRADE

Work on a three-story factory and office building has been started by the Swinehart company.

The Firestone Tire & Rubber Co. has added a new wing 200 feet long and four stories high to its office building.

The Canadian Consolidated Rubber Co., Berlin, Ont., has completed plans for the enlargement of its plant on Brethaupt street.

War orders for American auto trucks has had the effect of an impetus to the manufacture of solid auto tires by Akron companies.

The Victor Rubber Co., Springfield, O., has awarded a contract for a large addition to its plant to F. O. Jones & Co., building contractors, Springfield.

The Elyria Tire & Rubber Co., Elyria, O., will shortly begin the erection of a brick, steel and concrete plant, 80 x 106 feet, for the manufacture of hard rubber tires for automobile trucks.

The Perfection Tire & Rubber Co., of Chicago, will build a factory at Ft. Madison, Ia. The buildings and equipment will represent an outlay of about \$90,000. It is the intention to have the plant in operation by the last of July.

Messrs. W. H. Allen, of the Goodrich; Y. E. Hale and E. R. Hall, of the Goodyear; C. C. Carlton, of the Firestone, and J. H. Wawenhorst, of the United Rim companies, have been made members of the S. A. E. Standards Committee.

The Copithorne Rim & Tire Co., Inc., has made arrangements for the location of a plant at Attleboro, Mass., for the manufacture of quick detachable rims. The company purposes the erection of a plant that will give work at the start to about 500 men.

The National Double Tire Co., St. Louis, Mo., has been incorporated with a capital stock of \$16,000, by William Geist, George W. Milius and Adolph Schlesinger, to manufacture automobile tires, accessories, etc. Equipment is being sought for a plant.

Cliff Mathewson, associated with the Pacific coast work of the Diamond Rubber Co. before its consolidation with the Goodrich, is now associated with the sales force of The Norwalk Tire & Rubber Co., promoted by W. B. Miller, former Diamond official.

Stocks of rubber on hand in the rubber storehouses of this city are said to be worth at the present time close to \$10,000,000. Unusual buying has been going on as a result of war uncertainties, and never before has so much raw material been on hand at one time.

Some tire purchases of more than usual size have lately been reported, one of these being the purchase by the Ford Motor Co. of 137 carloads of automobile tires, while another was the purchase by a large bicycle manufacturer of 76,647 pairs of Goodrich and Diamond brands of bicycle tires.

At the annual meeting of The Morgan & Marshall Rubber & Tire Co., held at the office of the company in East Liverpool, O., on April 5, the following officers were elected: Patrick McNicol, president; W. A. Hobbs, vice-president; Joseph Betz, secretary and treasurer. These three officers, with R. J. Marshall, D. M. Cronin, Con. Cronin, William Erlanger, W. H. Cochran, J. H. Cramer, A. F. Ulrich and R. M. Gilleland, were elected to serve as directors for the ensuing year. This company has effected a new sales organization and will have ready to put on the market by May 1 a new M. & M. red tread tire.

The Swinehart Tire & Rubber Co. is adding a three-story steel and brick building, 122 x 105 feet, to its plant at Akron, O., which it expects to have ready for occupancy by the first of July. This building will be used for the extension of the pneumatic and truck tire departments, which are to be located on the first and second floors, and for the company's general offices, which will be on the third floor. In it will also be located a new and up-to-date hospital, as well as rest rooms for the employees. The addition to the line of a demountable and pressed-on type truck tire for heavy duty trucks, made in both the cellular and plain tread styles, is responsible in part for these changes.

OPPOSE "MADE IN U. S." LABELS

The National Association of Makers was organized recently in Chicago. The purpose of the organization being, among other things, to protest against the indiscriminating use of the label "Made in the United States" on goods for exportation. It is urged that the understandardization of goods made will result in this label being a distinct menace to goods abroad, as it would be attached to poor as well as good products. The International Harvester Co. is among the members of the new association.

APRIL MEETING OF THE ST. LOUIS I. V. & H. ASSOCIATION

The April meeting of the Implement, Vehicle and Hardware Association of St. Louis, was held at the Planters Hotel on the 15th. Preceding the business meeting, an elaborate banquet was served, during which the members and their friends were entertained by Miss Adele Uhlenhaut, daughter of W. A. F. Uhlenhaut. The speaker of the evening was Price Lane, member of the National Fire Protection Association, who addressed the meeting on "Fire Prevention and Fire Protection." The next meeting of the association will be held May 17.

90,359 FORD CARS IN TWO MONTHS

In the last two months the Ford Motor Co. has produced the enormous total of 90,359 cars, this including 43,849 cars in March and 46,510 cars in April. This insures the completion of the production of 300,000 Ford cars between August, 1914, and August, 1915, barring the unforeseen, and the rebating of all Ford purchasers within that period. In fact, the three hundred thousandth car will probably leave the Ford assembly early in July.

BUILT FOR SAFETY

The Winona Carriage Co., Winona, Minn., is shipping an order for 170 wagons to be delivered before the opening of the 1915 season of the Yellowstone National Park. The wagons are three-seated canopy-topped surreys—all exactly alike. The wagons are built for safety and service, things absolutely necessary for Yellowstone Park traffic.

RUSSELL FACTORY ADDITIONS

The Russel Motor Axle Co., North Detroit, recently broke ground for a new concrete building 120 x 30 feet, this being the first of four units of the same size the company proposes to erect.

OBITUARY

Charles H. Albrecht, who up until about a year ago was president and treasurer of the Charles H. Albrecht Carriage Supply Co., 615 Main street, Cincinnati, O., died on the morning of April 11 at his residence, 3532 Wilson avenue, Cincinnati, from the effect of a gun shot wound in his forehead and another in his right temple believed to be self-inflicted. The family is in excellent financial circumstances, and Mr. Albrecht is not known to have had any other worry except the fact that he had nothing to occupy his time. The carriage and accessory trades were represented in considerable numbers at his funeral and the floral offerings were extraordinary.

Oscar P. Copeland, 45, a traveling salesman for the Capital City Carriage Co., of Des Moines, Ia., passed away at his home in that city on March 26, of pneumonia, after an illness of ten days duration. He is survived by his widow and three children.

Wm. R. Donaldson, 78, for many years in the carriage building business in Wheeling, W. Va., died May 10. Deceased was born in New Castle, Pa., spending his early days there. He moved to Wheeling when quite young and later engaged in the carriage making business, under the firm name of the Donaldson Carriage Co. He was in this business for more than 30 years. During late years, however, he was in the insurance business. His widow, three sons and three daughters survive him.

Captain Edward Edgerley, 78, ex-mayor of Lancaster, Pa., and one of the most prominent carriage and automobile body builders of Pennsylvania, died April 21. During the Civil War, Mr. Edgerley rose from the ranks to command a company of the Seventy-ninth Pennsylvania Volunteers.

Stephen S. Fludder, 65, of Boston and Newport, R. I., a wealthy carriage manufacturer, committed suicide at his home in Middletown, R. I., April 8. Business worries is given as the cause. Mr. Fludder has been in the habit of spending the week end during the winter with his wife, whose summer home is in Boston. He left Boston after one of these visits, apparently in the best of health. Nothing more was heard of him until Mrs. Fludder, who is 30 years of age, received a telegram notifying her of her husband's rash deed.

Col. E. F. Foote, for many years a traveling representative in Texas for the Owensboro Wagon Co., died at his hotel in Brownwood, Tex., March 24, following a stroke of paralysis. The remains were taken to Owensboro for interment.

John J. Housman, the last of the old time carriage manufacturers of Rahway, N. J., passed away at his home in that city on March 26. He was 74 years of age and was born and lived his whole life in that city. For many years he was associated with the late William McManus under the firm name of Housman & McManus, conducting a carriage manufacturing business in Rahway. Mr. Housman is survived by his widow, two sons and two daughters.

Edward Kinsley, 77, veteran carriage builder of Beloit, Wis., died May 3 from a complication of diseases. Mr. Kinsley was born in Newton, N. J. He moved west in 1849 with his parents, first to Milwaukee for a short time and then to Janesville. In 1858 he moved to Rockton, where he started a carriage factory. In 1884, Mr. Kinsley moved his carriage factory to Beloit. More than 300 Grand Union Tea Co. wagons which are in use in large cities from coast to coast were built by him. He built and designed many of the finest hearses in the country. The hearse which bore him to his grave was built with his own hands several years ago. Three children, three grandchildren and one great-grandchild survive him.

Albert Moeck, 81, a pioneer wagon maker, died at his home in Peru, Ind., last month. He is survived by three sons and a daughter.

Howard A. Parker, manufacturer of carriages, at West Farmington, Maine, died early in April. His business has been purchased by Elmer B. Lowell, who will continue it along similar lines.

Fred. M. Pitner, of Laporte, Ind., formerly manager of the Colfax Pony Carriage Co., of South Bend, died at his home in Laporte, aged 55 years. Since last summer Mr. Pitner had been general secretary of the Laporte Y. M. C. A. He was born in Laport in 1860 and attended school in that city after which he entered the carriage and wagon plant of his father and at his father's death took charge of the establishment. He is survived by his mother and one brother.

Carl P. Schlamp, 43 years old, one of the most prominent business men of Henderson, Ky., and president of the George Delker Buggy Co., died at his home in that city on April 17. He had been in failing health for two years and death was



CARL P. SCHLAMP,
Vice-president C. B. N. A.

not unexpected by the members of his immediate family. For 20 years he had been at the head of the buggy company, and was connected with various enterprises.

Wm. Weitzel, for many years traveling man for H. Scherer & Co., Detroit, Mich., died April 8 at his home in that city. He is survived by two sons.

William Crane White, 41, died at the home of his mother, St. Marys, O., of tuberculosis, on March 28. He was a brother of Thos. A. White, of Crane & MacMahon, Inc., New York City. In September, 1892, he took a position with that firm and since that time remained in their employ as a salesman at New York, until about 1898, when he established himself in Buffalo as a manufacturers' agent, since which time he has represented the firm in the sale of its product in eastern territory, New York, Pennsylvania, New Jersey and the New England states. He was also representative in that territory for Daniel Delany & Son, Newark, N. J., manufacturers of springs, and a manufacturer of axles and a full line of carriage hardware. He was married in Buffalo, and his wife died there of tuberculosis in 1909. It is presumed he contracted the disease from his wife, as he was afflicted within a year or two after her death. He had no children.

PERSONAL MENTION

W. D. Gordon, of Peoria, Ill., who has represented Crandall, Stone & Co. and Cortland Forging Co. since 1903, will sever his relations with those companies July 1, and devote his time to the Sheldon Axle & Spring Co.'s line and other personal interests he has in Peoria.

Announcement is made that John H. Williamson has been named as representative in south Texas for the Ames Buggy Co., Owensboro, Ky. Mr. Williamson is well known to the Texas trade.

George W. Dunham, second vice-president and consulting engineer of the Chalmers Motor Co., of Detroit, has resigned from this position in order to devote his energies in a "free lance" capacity along similar lines of engineering work in which he has been engaged during the last ten or fifteen years. Mr. C. C. Hinkley, at present chief engineer of the Chalmers, will continue in that position, assuming the responsibilities of the position which Mr. Dunham has just resigned. As one of his first clients, Mr. Dunham has secured the Chalmers Motor Co. Two other companies have also made arrangements for a portion of his time, besides four other concerns have already taken up the question of retaining his services.

H. D. Hartley and Edw. C. Sendelbach, of Pioneer Pole & Shaft Co., are joining the party of American Iron & Steel Co. to California May 15. An all-steel special train takes the party to Panama Exposition and return.

H. F. Biggam, factory manager of the Troy (O.) Wagon Works has resigned. Temporarily, W. R. Hudson, research engineer for the wagon works company, is filling the position.

APRIL BEST MONTH FOR STUDEBAKER

Business and profits in the current fiscal year of the Studebaker Corporation, South Bend, Ind., are by far the largest in the corporation's history. War orders received last year were around \$17,000,000 and a large part of that business was carried into the current year. During the present year it is reported that additional orders have been received from Great Britain and France for automobiles, wagons and harness, the estimated value of which ranged from \$3,000,000 to \$5,000,000. Besides domestic business in the current season has been running large.

Never in its history has it had a month to compare with the one just closed. April marks high tide for the automobile, all sales records being smashed.

Enlargements of the plants are now being made so that production for the season of 1916 can easily take care of 60,000 machines.

RECEIVER FOR FULTON-WALKER CO.

J. Howard Wilson, president of the Fulton-Walker Co., wagon builders of Philadelphia, Pa., has been appointed receiver of that company with a bond of \$40,000. The company's financial status shows that its assets are double its liabilities, but because of a lack of ready cash to meet obligations due and about to become due the company requested the appointment of a receiver by proceedings in the United States court in Philadelphia.

JUERGENS GOES TO CHICAGO

Theodore Juergens will sever his connection with the Lauth-Juergens Motor Car Co., Fremont, O., and go to Chicago, where he will become its selling agent. The plant has a number of orders, including a 100-truck order from Europe.

WANTS

Help and situation wanted advertisements, 1 cent a word; all other advertisements in this department, 5 cents a word; initials and figures count as words. Minimum price, 30 cents for each advertisement.

PATENTS

Patents—H. W. T. Jenner, patent attorney and mechanical expert, 606 F St., Washington, D. C. Established 1883. I make a free examination and report if a patent can be had and exactly what it will cost. Send for circular.

FOR SALE

For Sale—Large quantity of 1/4 in. Dia. Standard Axle Clips, all lengths from 1 1/2 in. to 3 1/2 in. inclusive. All in first class shape, but on account of being obsolete, can make very attractive prices. If interested, send for samples. Stewart-Warner Speedometer Corporation, Purchasing Dept., 1826 Diversey Bl., Chicago, Ill.

TRAFFIC CHANGES

On May 27 the Western Classification Committee will take up for consideration a number of proposed changes involving carriage and wagon parts. A long list of changes, which apparently are intended to make almost an entirely new classification, are announced.

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JOHN W. MASURY & SON

Originators of

Superfine Coach and Automobile Colors

ACKNOWLEDGED THE STANDARD FOR FIFTY YEARS

And Manufacturers of

Fine Carriage and Automobile Varnishes

New York

Chicago

Minneapolis

Kansas City

SHELDON AXLES AND SPRINGS

**For Horse-Drawn and Power-Propelled
Vehicles of All Kinds**

JUST ENOUGH BETTER THAN OTHERS TO BE NOTICEABLE

When you specify "Sheldon" you are not experimenting with experiments, but are getting Axles and Springs with years of manufacturing experience back of them—Axles and Springs that are selected for important work where conditions make reliability supremely important.

SHELDON AXLE AND SPRING COMPANY, WILKES-BARRE, PA.

LARGEST AXLE AND SPRING FACTORY IN THE WORLD



Go to Chicago With Your Ad Man

Attend with him the big Convention of Associated Advertising Clubs of the World, June 20 to 24, 1915

You will assimilate more knowledge of modern methods of Advertising, Selling, Distribution, and Management during these five days than could be obtained in a life-time of book study.

You will be brought in touch with the men who have done and are now doing the big things of business. You will participate in the biggest business meeting the world has ever known. You will listen to the expressed thoughts of distinguished Americans concerning present day and future business movements.

You will enjoy Chicago's wonderful park system, boat rides on Lake Michigan, modern hotels, theatres, and other amusements, including the big street pageant, and the Gridiron Show given at the Auditorium Theatre by 150 Chicago Advertising men.

Distinguished Speakers. President Wilson, State conditions permitting, will head the notable array of speakers. Hon.

William Jennings Bryan, George Horace Lorimer, Arthur Brisbane, John H. Fahey and Henry Watterson are among the others who will be heard.

Advertisers in and publishers of trade and technical journals will hold special Departmental meetings to discuss their own problems and learn how they can co-operate to better advantage. Other departmental meetings will take up such subjects as catalogues, engraving, printing, mailing lists, sales plans and kindred subjects.

The ladies are wanted too. Special entertainment—teas, luncheons, automobile trips, etc., is being arranged for them by Mrs. Chas. H. Potter and her committee.

Clear up your desk. Take a five days' vacation in a lake-cooled city. Mix with the business builders. You will return a better business man; a better physical man; and a better thinking man.

**For further information, programme, rates, etc., address
Convention Bureau, Advertising Building, Chicago, Ill.**

—WILLEY'S COLORS

The RECOGNIZED STANDARD



C. A. WILLEY CO.

COLOR GRINDERS

and Manufacturers of Specialties in

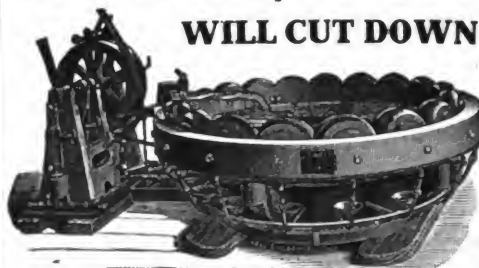
CARRIAGE, AUTOMOBILE AND CAR

PAINTS

COLORS, VARNISHES, ETC.

HUNTER'S POINT, NEW YORK CITY

The WEST Hydraulic Tire Setter WILL CUT DOWN EXPENSE



Tires set cold in one minute. This machine saves time—does the work better and quicker, does away with burned streaks. Only necessary to measure one wheel in a lot. Does not char the rim, and thus make the tire loosen prematurely.

Saves resandpapering of wheels. This machine is now increasing the profits of many manufacturers. Send for catalog and read about it.

WEST TIRE SETTER CO.,

ROCHESTER, NEW YORK

Established 1886

Correspondence School of Carriage and Motor Carriage Drafting

A thorough, practical tuition is given through this correspondence school. The theory and practice of construction, bookkeeping, perspective. Many men now hold good positions through taking the courses of instruction.

Principal, **THOS. MATTISON,**

Hillside Avenue, Bitterne Park,

Southampton, England

Author of "The Coach Body Makers' Guide," \$3.00; a practical treatise on "The Suspension of Carriages," "Bookkeeping," and other carriage building works.

WHAT IT IS

The American Harness and Saddlery Directory

The 1914 Edition

An extra painstaking revision of the names (and other information as below) constituting the Retail Harness Trade, has been completed for this year's issue of the Directory, and we think the work is so important and worthy that the

1914 Price Is \$5 Per Copy

and it is very moderate for what is offered in a work that is

Indispensable for Reference

for copying of addresses, and for all purposes usual in a directory.

Just a Sketch of Its Contents

The list of the **WHOLESALE** and **JOBGING TRADE** is so arranged as to make it convenient to separate the association members from those not so recognized.

The **RETAIL HARNESS MAKERS** of the United States and Canada comprise the principal part of the Directory, arranged by State, Town and County, and in the large cities, the street and number is given. Those rating (approximately) over \$1,000 are marked.

A list of **HARNESS DEALERS** as distinguished from retail harness manufacturers, is also given. The value of this list to those who solicit the vehicle, implement, hardware and department stores will be readily appreciated.

A list is also published of Export Commission Merchants, giving the class of merchandise they handle.

PUBLISHED BY

THE TRADE NEWS PUBLISHING COMPANY

PUBLISHERS OF "HARNESS"

EDISON BLDG., COR. ELM AND DUANE STS., NEW YORK

PORTER'S BOLT CLIPPERS

"Easy" "New Easy" Allen-Randall



To Cut 5-16, 3-8, 1-2, 5-8, 3-4 inch.

H. K. PORTER,**EVERETT, MASS.**CARRIAGE—WAGON—AUTOMOBILE
AND SPECIAL**DROP FORGINGS**QUALITY—THE
BEST**Richard Eccles Co., Auburn, N. Y.**PROMPT
SERVICE.

WRITE FOR CATALOG.

SEND BLUE-PRINTS OR MODELS
FOR OUR QUOTATIONS—IT WILL PAY YOU!**THE FAIRFIELD RUBBER COMPANY**

Manufacturers of

Carriage Cloth, Imitation Leather,
Automobile Cloths, etc.**FAIRFIELD,****CONNECTICUT****Cargill Service**

has brought to the Cargill Company more Vehicle Catalogues than are made by any other printing house in America.

Cargill Quality is bringing The Best Automobile Catalogues to our plant for Complete production—watch for our imprint in the Season's best books.

THE CARGILL COMPANYDESIGNERS
ENGRAVERSPRINTERS
& BINDERS

Grand Rapids, Michigan

THE F. H. LAWSON CO.

CINCINNATI, O.

Manufacturers of

Metal Buggy Seats

FLEUR DE LIS PATTERN

**NEW STYLES—ALL SIZES****STRONGEST—NEATEST—BEST**

No Solder Used

YOUR VEHICLE SELLS WHEN EQUIPPED WITH

LAWSON'S METAL SEATS

Write for Prices

Carriage MechanicsDesiring to improve their present
Condition should attend the**TECHNICAL SCHOOL**

FOR

Carriage Draftsmen and Mechanics

SUPPORTED BY THE

Carriage Builders' National Ass'n

The object of the School is to teach men to design vehicles and make working drawings, and to otherwise facilitate their work in the shop. Only those men employed in carriage or automobile building or their accessory trades are admitted to its privileges.

The classes are conducted in three divisions, viz.: Corresponding, Day, and Evening. The former is open during the entire year, while the day and evening classes are in session only from October 1 to April 1.

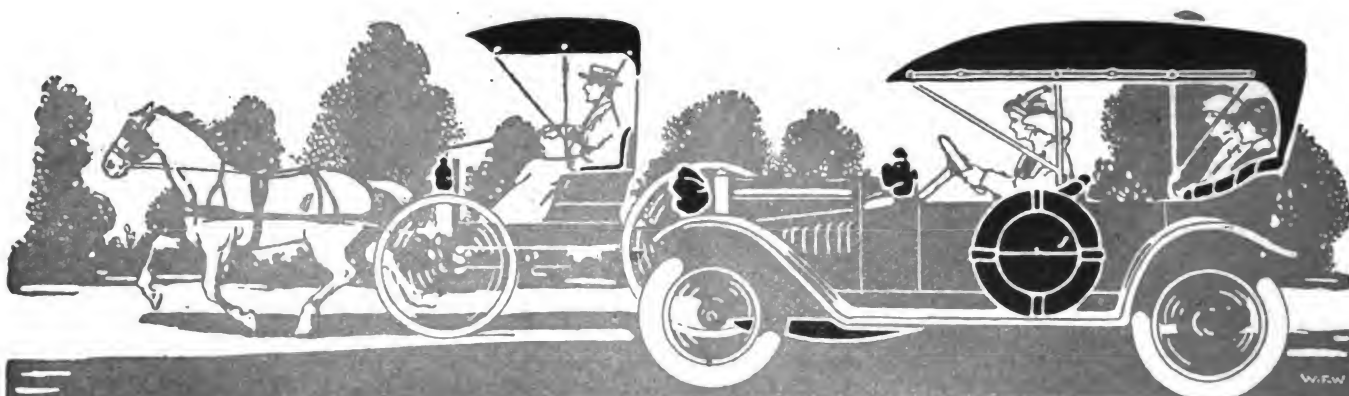
The tuition is moderate.

For prospectus and full particulars, write to the instructor,

ANDREW F. JOHNSON,

20 West Forty-fourth St.,

NEW YORK CITY



Learn More About The Leading Leather Substitute

Every carriage and automobile manufacturer—every manufacturer of carriage and auto accessories, storm curtains, aprons, lamp covers, tire cases, trunks, etc., should get and examine samples of

MERITAS

LEATHER CLOTH

Only by seeing the goods—by testing them—by noting the handsome, durable, non-cracking finish and the fine line of colors can you appreciate the high quality we have attained in the manufacture of a serviceable leather substitute.

There are styles, colors and finishes in MERITAS LEATHER CLOTH suitable for every carriage and auto trimming and upholstery purpose.

It can be had in muslin, duck and drill; dull or glazed; smooth or grained; in black and colors.

Sample book on request—write now and know more about the leading leather substitute.

Write
for
sample
book of
MERITAS
LEATHER CLOTH
NOW

The Standard Oil Cloth Co., Inc.

320 Broadway, New York

The Hub

Copyright, 1915, by the Trade News Publishing Co., of New York

Entered in the New York Post Office as Second-class Matter

Vol. LVII

JUNE, 1915

No. 3

THE TRADE NEWS PUBLISHING CO. OF N. Y. Publishers of THE HUB

J. H. WRIGHT, President

G. A. TANNER, Secretary and Treasurer

EDISON BUILDING, COR. ELM AND DUANE STS., NEW YORK

Other Publications of Trade News Publishing Co.:

HARNESS (monthly).....per year, \$1.00
AMERICAN HARNESS AND SADDLERY
DIRECTORY (annual).....per copy, \$5.00

THE HUB is published monthly in the interest of employers and workmen connected with the manufacture of Carriages, Wagons, Sleighs, Automobiles and the Accessory trades, and also in the interest of Dealers.

Subscription price for the United States, Mexico, Cuba, Porto Rico, Guam the Philippines, and the Hawaiian Islands, \$2.00, Canada, \$2.50, payable strictly in advance. Single copies, 25 cents. Remittances at risk of subscriber, unless by registered letter, or by draft, check, express or post-office order, payable to the order of THE TRADE NEWS PUBLISHING Co.

For advertising rates, apply to the Publishers. Advertisements must be acceptable in every respect. Copy for new advertisements must be received by the 25th of the preceding month, and requests to alter or discontinue advertisements must be received before the 15th day of the preceding month to insure attention in the following number. All communications must be accompanied by the full name and address of writer.

FOREIGN REPRESENTATIVES:

FRANCE—L. Dupont, publisher of *Le Guide des Carrossiers*, 78 Rue Boissiere, Paris. Subscription price, 15 francs, postpaid.

GERMANY—Gustave Miesen, Bohn & Rh. Subscription price, 12 marks, postpaid.

ENGLAND—Thomas Mattison, "Floriana," Hillside avenue, Bitterne Park, Southampton. Subscription price, 12 shillings, postpaid.

Entered in the New York Post Office as Second-class Matter

Wagon Standards

The cost of producing farm wagons has been steadily increasing for years past. Advances in cost of labor and material, also the increase of the number of styles and sizes, resulting in an unnecessary number of combinations, have been responsible for the production cost increase. This condition has also made the selling cost higher than it should be.

Elsewhere in these pages will be found the report of a committee appointed by the National Implement and Vehicle Association, to work out plans for the standardization of farm wagons. This committee was appointed in response to demands of manufacturers, dealers and users, and has been at work for considerably more than a year. The plans presented by the committee have already been adopted by some manufacturers and others are expected to follow the example.

Standardization such as has been proposed and which apparently is to become an established fact in the near future will not reduce the number of sizes and types of wagons to a degree that will deprive the user of any essential combination, but it will mean economy not only

in construction but in the cost of distribution. And it will insure the maximum of value and utility to the consumer. This is indicated by several modern examples of the wonderful results of standardizing a product, the Ford motor car being a notable one.

Complete co-operation on the part of dealers and jobbers is essential to the success of the plans now being adopted. That this will be given heartily by all who realize the importance of standardization is a foregone conclusion.

Need of Concerted Effort

The recent visits to this country of the commercial representatives of our Latin-American neighbors, and of the Orient, serve to point out factors of increasing interest and value to our manufacturers.

The delegates from the Latin-American republics represent a population of many millions. All of these countries have great resources awaiting development. Their representatives came to us seeking our products in reciprocal trade. The opportunity to build up an export trade worthy of our vast industries ought to be eagerly grasped by our manufacturers. This country is now in need of foreign markets.

The following comment on the situation here, by the Merchants' Association of New York, furnishes pertinent facts of particular interest just at this time. The point to be made is easily recognized:

"For the first time, the United States is feeling the need of foreign markets for its manufactured products. Its industrial energy has outgrown its requirements at home and an outlet abroad must be found if its productive growth is to continue. At this juncture the invitation extended to us by our neighbors in the South and the Orient is particularly opportune.

"In order to take advantage of it, we must loosen the fetters which we have placed upon ourselves. We need ships to carry our merchandise overseas, we need banking facilities abroad, and we need freedom to form combinations for the sale of our products. With regard to the best means for obtaining these essentials there is a difference of opinion, but since everybody admits that we must have them, it cannot be doubted that we shall get them somehow. It would be absurd to assume that we shall allow the foreign trade opportunities which are being presented to us to be lost because we have not sense enough to grasp them.

"It rests largely with the business men of the United States to see to it that the handicaps which we have

inadvertently placed upon ourselves are removed. The chief obstacles to the increase of our foreign trade are to be found at home, and unless they are cleared away the hope of expansion upon a large scale is destined to disappointment. The disposal of these obstacles is a matter which the business men, who alone knew the needs of the situation, must attend to for themselves through co-operative endeavor. That they will meet with obstinate opposition has been demonstrated by past experience. Only through united effort can the shackles be struck off."

STOPPING IN TRANSIT CASE

The adjourned hearing of the above-mentioned case, before Examiner Bell of the Interstate Commerce Commission, was held on May 19 and 20 in the Federal court room at Chicago.

Mr. E. J. McVann, attorney for the National Implement and Vehicle Association, assisted by Mr. S. D. Snow, Mr. W. J. Evans, traffic manager of the association, and Mr. H. F. Lindsay, representing the National Industrial Traffic League, conducted the case for the manufacturers and retail dealers.

The following is a list of the dealers' associations representation:

Western Retail, Implement, Vehicle and Hardware Association—H. J. Hodge, secretary, Abilene, Kas.; E. C. Hood, Pittsburgh, Kas.; H. D. Skinner, Braymer, Mo.

Wisconsin Implement and Vehicle Association—F. R. Sebenshall, secretary, Eau Claire, Wis.; J. B. Du Bois, Green Bay, Wis.

Iowa Implement Dealers' Association—W. A. Jones, secretary, Hampton, Ia.; J. L. Farrington, Iowa Falls, Ia.; E. P. Armknecht, Donnellson, Ia.

Minnesota Implement Dealers' Association—C. I. Buxton, secretary, Owatonna, Minn.; Casper Wackman, Detroit, Minn.

Tri-State Vehicle and Implement Dealers' Association—P. T. Rathbun, secretary, Springfield, O.; T. H. George, Jr., Covington, Ind.

Michigan Retail, Implement and Vehicle Dealers' Association—J. F. Follmer, secretary, Vicksburg, Mich.; E. J. Merrifield, Bloomington, Mich.

Illinois Retail Implement and Vehicle Dealers' Association—F. L. Warrington, secretary, Galesburg, Ill.; W. P. Morris, Decatur, Ill.; A. R. Keeler, Altoona, Ill.; H. E. Burkholder, Sterling, Ill.

South Dakota Implement Dealers' Association—J. M. Muggli, Ramona, S. D.

Mid-West Implement Dealers' Association—Wm. Krotter, Stuart, Neb.; Walter W. Bass, Anselmo, Neb.

Mississippi Valley Implement Dealers' Association—W. C. Mangold, secretary, Anna, Ill.; Louis J. Ringe, St. Charles, Mo.

The following members of the Association's Traffic committee and Traffic Managers of the manufacturers were present and assisted in the conduct of the case:

Messrs. A. R. Ebi, F. S. Pool, E. S. Case, L. R. Martin, J. Kanter, J. H. Miller, C. T. Bradford, G. E. Welch, E. D. Ryan, J. D. Hollowell, F. P. Cory.

The evidence presented by the manufacturers and dealers was overwhelming and conclusive, not only as to the necessity for the continuance of the stopping in transit service, but the fact that the railroads have been more than adequately paid for it. The discontinuance of it would be a serious loss not only to the trade in general, but particularly the small dealer and farmer, furthermore, would undoubtedly require the rearranging of the entire system of distribution in certain implement, vehicle and machinery lines.

The loyalty of the retail dealers and the efficiency of their organizations is indicated by the fact that nearly every dealer's association called upon furnished at their own expense

two competent witnesses, and in only two instances did the witnesses assigned to this case fail to appear, and in those cases satisfactory reasons were given for their failure to come.

It is hoped that the carriers will realize that when the rights of the shippers are attacked in this unjust way they will on every occasion spend time and money to maintain them. It is also to be regretted that shippers are so frequently subjected to extraordinary and, we believe, unnecessary expense, where a conference between carriers and shippers might adjust some of these matters at a great saving in time and expense. While we will not attempt to prejudice the commission's action in this case, we do not believe that the shippers' side of the controversy could have been presented more strongly.

The case has now been completed as far as the examination is concerned and June 10 is the date set for the filing of briefs. Arguments before the commission will occur later.

E. W. McCULLOUGH,

General Manager, National Implement and Vehicle Assn.

CLIFTON AGAIN HEADS N. A. C. C.

Charles Clifton, treasurer of the Pierce-Arrow Motor Car Co., Buffalo, N. Y., was re-elected president of the National Automobile Chamber of Commerce, Inc., at the annual meeting held in New York City, June 6. The other officers were all re-elected, as follows: First vice-president, W. C. Leland, vice-president and general manager Cadillac Motor Car Co.; second vice-presidents (gasoline passenger car division), Hugh Chalmers, president Chalmers Motor Co.; (commercial vehicle division) Windsor T. White, president White Co.; (electric vehicle division) H. H. Rice, president Waverley Co.; secretary, R. D. Chapin, president Hudson Motor Car Co.; treasurer, George Pope, receiver Pope Mfg. Co.; general manager, Alfred Reeves.

Beside re-electing three directors whose terms had expired, the chamber elected three new ones for a three-year term. These are J. Walter Drake, president Hupp Motor Car Co.; R. E. Olds, president Reo Motor Car Co., and C. H. Pelton, secretary Maxwell Motor Co., these taking the places of Messrs. H. O. Smith, L. H. Kittredge and C. C. Hanch. Those re-elected were Alvan Macauley, manager Packard Motor Car Co.; W. E. Metzger, American Electric Car Co., and C. W. Churchill, general manager Winton Co.

After a spirited discussion of the jitney bus situation the conclusion was reached that the movement should be encouraged and supported by car manufacturers. Proper regulation was also advocated, it being agreed that there should be careful supervision of drivers, with payment of a license fee for the use of the streets and provision for indemnity against accidents. A special committee is continuing this work.

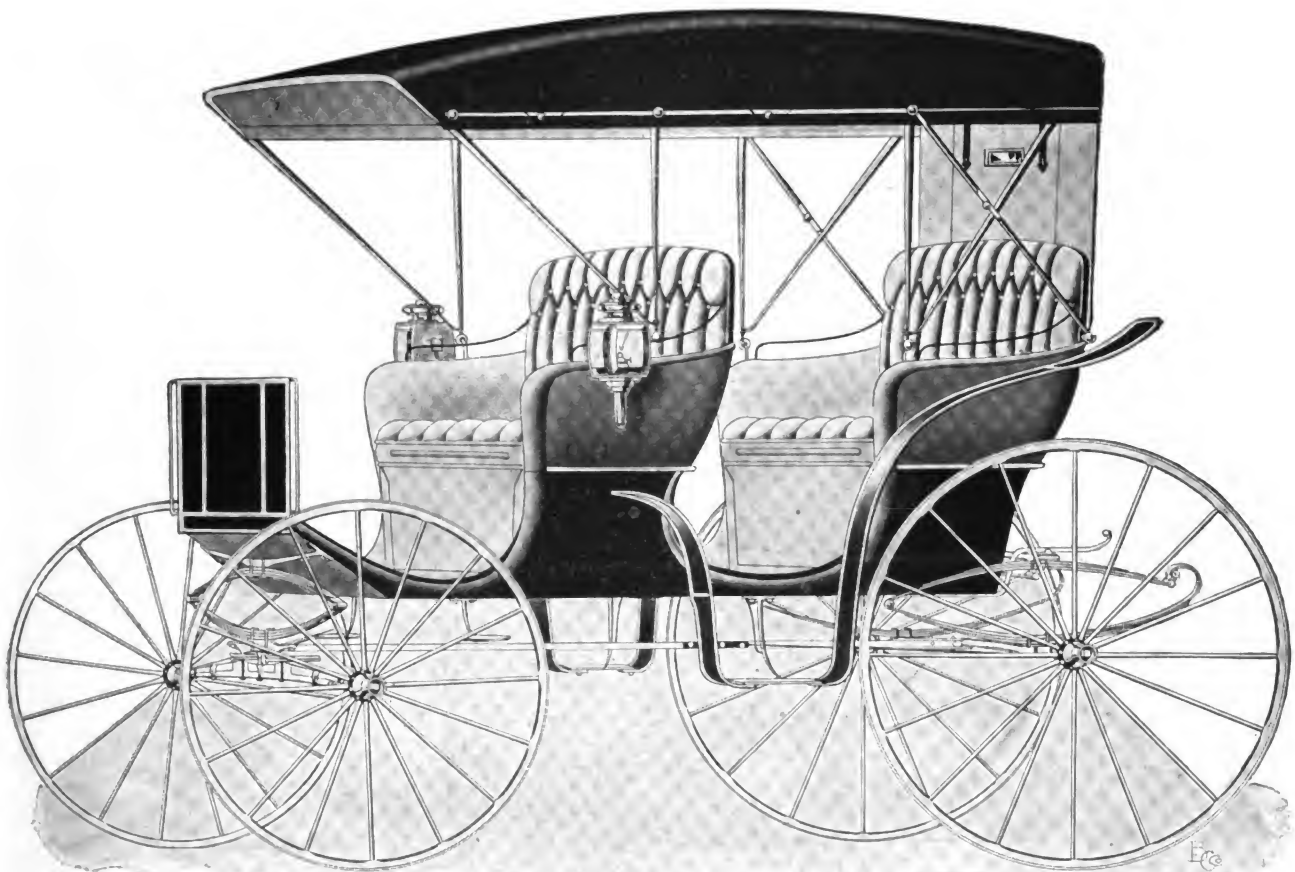
A special committee was appointed to make recommendations in regard to the proper time for making annual announcements of car models.

It is not unlikely that one or two of the general membership meetings of the chamber may be held in Detroit, although the annual meeting will naturally be held each year at the general headquarters in New York City, as required by the incorporation of the N. A. C. C. in New York state.

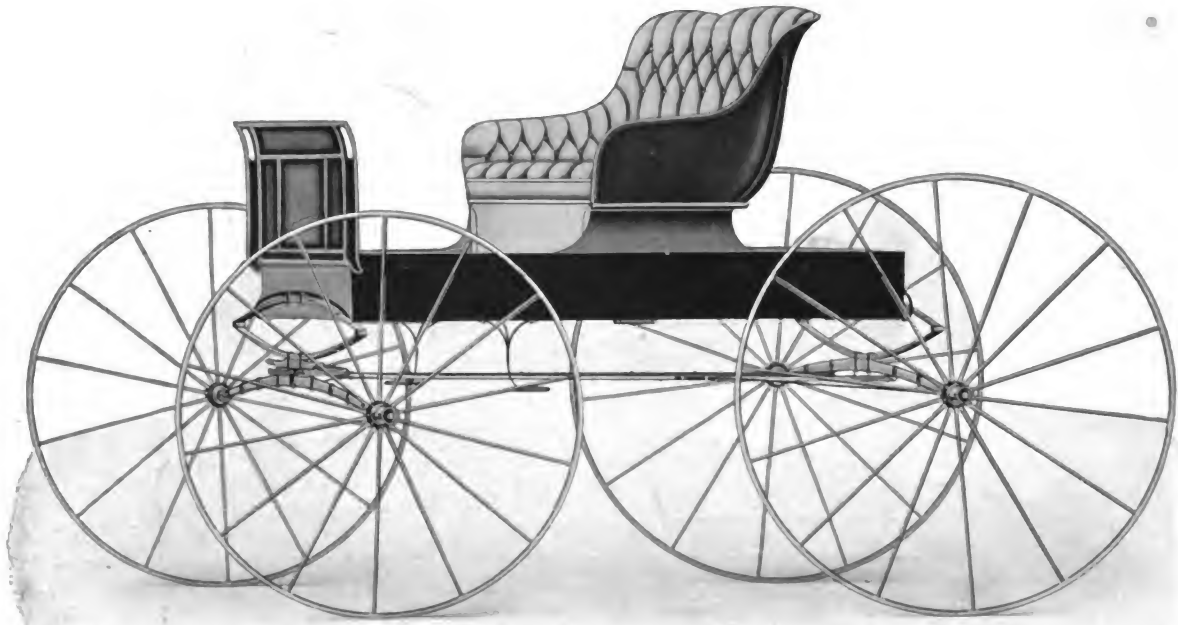
It was voted to appeal from the decision of the Cleveland Court in the suit brought against Rauch & Lang Carriage Co., a member of the chamber, by William B. Hanlon and others, charging infringement of Hanlon patent re-issue No. 13,653, covering the well known Hanlon windshield construction.

BOSTON 1916 CAR AND TRUCK SHOW MARCH 4-11

At the annual meeting of the Boston Automobile Dealers' Association it was decided to hold the 1916 motor show in Mechanics' Building the second week in March, and there will be an exhibit of commercial vehicles in the basement the same week.



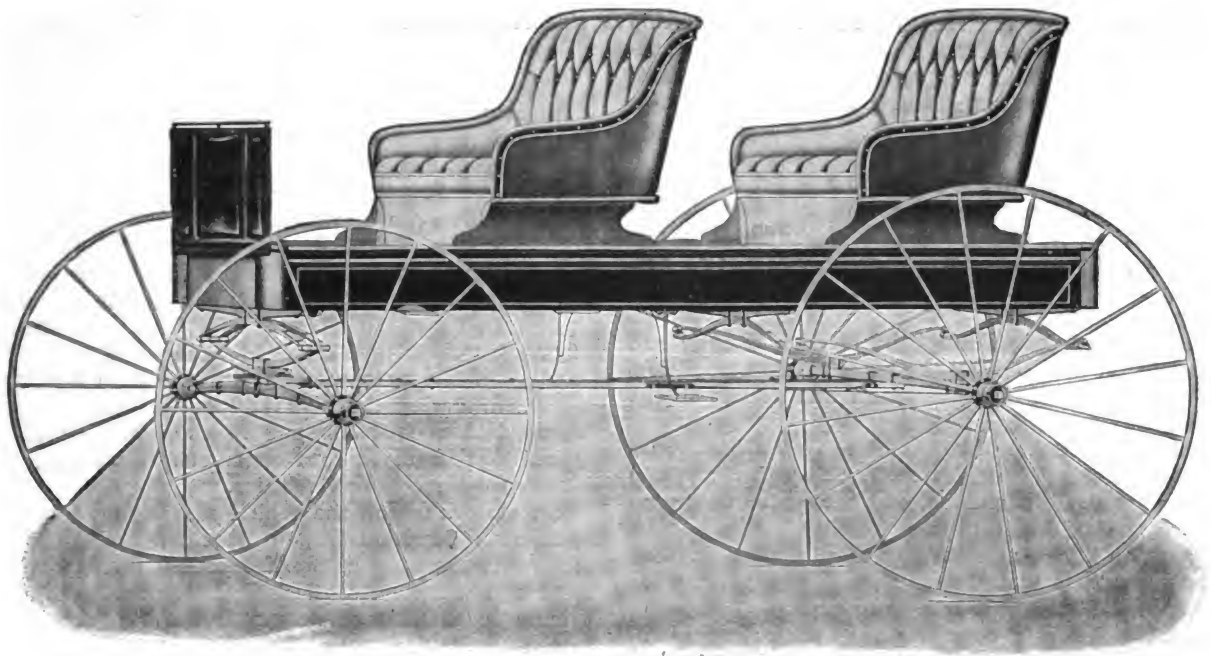
JUMBO SURREY
Manufactured by
D. M. SECHLER IMP. AND CAR. CO.
Moline, Ill.

**DRIVING WAGON**

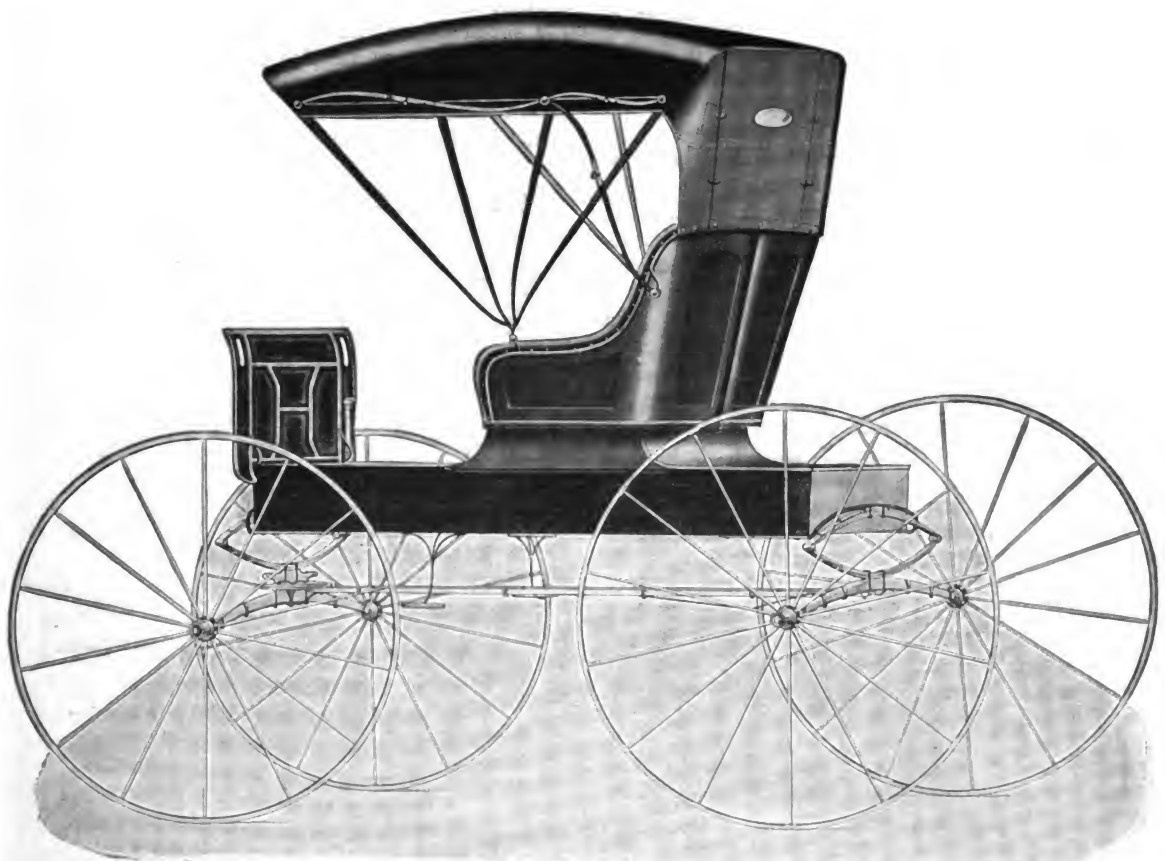
Manufactured by
D. M. SECHLER IMP. AND CAR. CO.
Moline, Ill.

**CONCORD BUGGY, WITH PHAETON SEAT**

Manufactured by
THE SAYERS & SCOVILL CO.,
Cincinnati, O.



No. 2146 SPRING WAGON
Manufactured by
MOLINE PLOW CO., HENNEY BUGGY BRANCH,
Freeport, Ill.



No. 60-H BUGGY
Manufactured by
MOLINE PLOW CO., HENNEY BUGGY BRANCH,
Freeport, Ill.

C. B. N. A. MEMBERSHIP CAMPAIGN

The Carriage Builders' National Association membership committee is now engaged in an active campaign for new members. The committee is using circulars, letters and personal invitations in the effort to bring in new members. We print herewith a circular letter sent out by the committee recently:

"All organizations of every kind—religious, political, business and social—lose members every year from different causes, deaths, change of business, removal and resignations.

"Our association is in no way different from any other in this loss. To keep up our strength we must enroll some new members every year. For this reason we send this letter to you and to all our members.

"There are thousands of vehicle builders who, directly and indirectly, have been identified by the work of the association. This also applies to the manufacturers of and dealers in the materials used in constructing vehicles.

"We need these as members, and we desire your aid to secure as many as possible this year. Please take this to heart. Lend us your aid by personal solicitation, and secure for us during the next six months at least one new member.

"We think by an effort, and keeping this in mind you can accomplish this and help the association, which is working for the benefit of all the vehicle people.

"Enclosed you will find a circular giving the rules governing both classes of members, and an application blank for use in recording those whom you may secure.

"We hope we will have your help and that this year may be a banner year in this matter of new members."

The committee is composed of the following well known gentlemen: C. C. Hull, Connersville, Ind., chairman; S. G. Gay, Ottawa, Ill.; L. I. Hatfield, Sidney, N. Y.; J. H. Poste, Columbus, O.; Geo. Hackney, Jr., Washington, N. C.; P. J. Zimmerman, Atlanta, Ga.; Carl D. Fischer, Terre Haute, Ind.; G. W. Luetkemeyer, Cleveland, O.; Robertson S. Ward, Newark, N. J.

PATENT LEATHER MEN MEET

The spring meeting of the Patent and Enamel Leather Manufacturers' Association was held Wednesday, May 26, at the Board of Trade, Newark, N. J., and was largely attended, the western trade being particularly well represented. The meeting was opened by President James F. Taylor, of the American Oak Leather Co. Following the president's address and reports of standing and special committees, the extreme prices paid for green salted spready hides was the topic of chief discussion. The recent high figure of 26c secured, with one packer demanding up to 28c in Chicago, excited considerable comment; but since the gathering up to 26½c was paid in New York for June forward slaughter, so that evidently the market is beyond the control of the tanners. Basing their quotations on finished leather on a 26c hide market, tanners claimed that an increase of as much as 8c on grain leather would have to be secured to allow of some profit.

Another topic under discussion was the second split proposition, used by the upholstery trade for plain work and tufting. It was pointed out that the second split is adaptable for the former purpose but when used for tufting it fails to give service.

The following members were in attendance: George Stengel, George Stengel, Inc., Newark, N. J.; James F. Taylor, American Oak Leather Co., Cincinnati, O.; James Smith, 3d, Halsey & Smith, Newark, N. J.; Harry N. Hill, Cleveland Tanning Co., Cleveland, O.; Herbert Gay, Blanchard Bros. & Lane, Newark, N. J.; Charles Whitney, Conneaut Leather Co., Conneaut, O.; John F. Conroy, E. S. Ward & Co., Newark, N. J.; William Hatton, Ottawa Leather Co., Grand Haven, Mich.; James T. Smith, Hugh Smith, Inc., Newark, N. J.; R. C. Good, Lackawanna Leather Co., Hackettstown, N. J.; Peter Loehnerberg, Atlantic Leather Co., Newark, N. J.; Max Hertz, Newark, N. J.; A. Rothschild, Stengel & Rothschild, Newark, N. J.

EFFORT TO ABOLISH 60-INCH TREAD

Vehicle Makers Meet With N. A. C. C. to Standardize 56-inch Tread

Automobile manufacturers have been compelled to furnish 60-inch treads in the southern states because of the wider wagon treads used in that section. The National Automobile Chamber of Commerce has been for over a year endeavoring to see if the 60-inch tread can be discontinued and, with this object in view, Alfred Reeves, general manager of the N. A. C. C., had a conference June 8 with representatives of the various wagon and vehicle associations in conference in Washington, D. C., with the result that the wagon makers passed resolutions favoring a standard tread for the near future and looking to the automobile makers to lead the way in this movement during the next 12 months. For the present the wagon makers will continue 54 and 60-inch treads, but are agreed that improved road conditions demand the adoption of a standard tread for all vehicles.

The various wagon and vehicle associations were represented as follows: National Wagon Manufacturers' Association, J. D. Hollowell, chairman of the Tread Committee; National Implement and Vehicle Association, E. W. McCullough; Southern Wagon Manufacturers' Association, B. P. Thornhill. Others in the conference were: Logan Waller Page, of the United States Bureau of Good Roads; D. E. Parsonage and Alfred Reeves. Mr. Reeves emphasized the fact that 15 out of 95 manufacturers who are members of the N. A. C. C. manufactured wide-tread cars, that is 60-inch treads, and that the majority of automobile dealers in the south are strongly in favor of discontinuing these treads because they hold up deliveries. Manufacturers object to them in that they seriously handicap production and make it impossible to switch shipments from a point in the north where standard treads are used to one in the south where the wide tread is desired. Wagon manufacturers are agreed in this argument. Mr. Page, representing the government good roads favors a standard tread and considers it highly desirable now that the movement for improved roads in the south is under way.

ST. LOUIS VEHICLE DRAFTING SCHOOL EXHIBIT

The St. Louis Vehicle Drafting School, conducted by the Board of Education, made an interesting exhibit of the students' work before the members of the Implement, Vehicle and Hardware Association of St. Louis, who are back of the school, at their April meeting. A public exhibition was also held at the Planters' Hotel and The American Annex for the benefit of all those interested in the education of vehicle mechanics.

The St. Louis School of Vehicle Drawing and Construction is one of a number of branches of study offered by the St. Louis Board of Education to the night classes, which meet on Mondays, Wednesdays and Fridays of each week during the months from October to March, inclusive.

This particular department was inaugurated last October with an average attendance since of 16 students. Ten young men at the close of the school term received certificates of merit, permitting them to advance to higher grades of studies in this particular line at the reopening of the classes next September.

OLD CARRIAGE FIRM FAILS

A voluntary petition in bankruptcy was filed May 27 in the United States District Court, Brooklyn, by the I. S. Remsen Mfg. Co., of 740 Grand street. It is one of the oldest carriage concerns in that part of the country. The liabilities of the firm are placed at \$91,905.27, of which more than \$84,000 consists of unsecured debts.

SPRING DESIGN

By C. H. Gleason*

Spring making is not an exact science. The nature of the service required precludes this. It can never become an exact science. The whole process is more or less a compromise, intended to meet conditions which are variable. This applies to every detail—to dimensions, to proportions, to capacities, to reactions—in short, to every element entering into the making of springs. While other parts are made to resist shocks, springs are made to take shocks, usually within prescribed limits.

Neither are exact capacities possible. They are modified by variations in the thickness of the steel, the action of heat in the processes of manufacture, the finishing of the plates, and the varying conditions of the service required. Therefore, the tolerances in spring making must be greater than in most other parts. Limits which are liberal in machine operations are out of the question in spring making if the springs are to be produced at popular prices in a wholesale way.

While these conditions make spring designing perplexing, they also make it an interesting, we might say a most fascinating, study. It must not be inferred that the fundamental principles of spring making are not clearly understood or in any way uncertain. The nature of the service required makes it most important that they be well understood if any degree of success is to be obtained. It is not, however, my purpose to discuss fundamentals. These are being discussed from time to time exhaustively by others being fitted for this work. While the fundamentals are interesting, instructive, and in fact necessary to know if one would be well grounded in the science, I believe that other fields quite as interesting can be made productive of useful information. While I shall treat the fundamentals as axiomatic for the purpose at hand, I shall aim to confine myself well within standard practice. The engineer is vastly more interested in results, in making sure that his car will meet expectations when put to the test, than he is in finding reasons afterwards for its failure. His greatest pleasure and satisfaction come when it makes good. It is with the hope of adding some useful item to his store of knowledge that I propose to discuss some of the more important elements of spring design.

Automobiles may be classified according to their motive power. Gasoline cars may be classified as commercial, racing or pleasure cars. In electric vehicles the weight of the car, the comparatively low payload, the moderate speed at which they run, and the short wheelbase are important factors. In gasoline commercial cars the conditions are quite similar but somewhat modified by the lighter proportional weight of the car, the comparatively greater percentage of payload, the increased speed at which they run, and the longer wheelbase. Racing cars are also a law unto themselves. They are governed largely by the personal notions of the designer. While certain general characteristics, such as light weight, level roads, extreme power and high speed enter into the designing of springs for them, it is not easy to treat the subject so as to get anywhere unless one is dealing with the individual designer and the individual car. Gasoline pleasure cars, in the varieties built, wide range of weight, variation between weight of car and load carried, wide range of ideas of speed, variety of opinions as to proper type of springs to use, and an almost infinite number of other details, furnish such a fertile field that I propose to confine myself herein to them alone.

In considering the problem of spring suspension certain general details have an important bearing, as follows: 1, weight of car; 2, load to be carried; 3, speed at which the car is to run; 4, wheelbase. Every car must be designed to meet the worst conditions that may be imposed on it. While these

conditions may be only momentary, or during a limited period, if the car fails, all else will be forgotten. A light car requires different treatment than a limousine, the lighter car being often the harder to handle. In either case, however, the load to be carried by the springs is the first determining factor.

Because one car may prove satisfactory with a given type and dimension of spring, it does not follow that the same type and dimension of spring can be applied with equal success to an entirely different car. Trying this often causes disappointment, and condemnation of the spring maker when he is in no way at fault. It is necessary to proportion the spring properly, not only in capacity, but in length, width and opening, for the load it must carry and the service required. The relation of the passenger load to the total load must be considered. It is necessary to have a certain minimum amount of deflection in any spring to insure even passable riding qualities. At least this much should be provided in the empty car; otherwise, the car may be fairly satisfactory when carrying the maximum load but more or less of a failure when the load is reduced.

The wheelbase of the car, while not as important today as formerly, is worthy of consideration. While most cars can be treated alike in this respect, yet if the wheelbase be shorter than the average, care must be exercised, while an unusually long wheelbase often permits, if it does not require, modification of design.

Other conditions having been met satisfactorily, the speed of the car will not affect the action of the rear springs seriously. The front springs, however, require thought where the speed is above the average. In a general way, where it is desired to have the front springs at their best at a greater speed than 35 to 45 m.p.h., the deflection must be reduced or the front of the car will be sloppy and hard to control. Reduction of deflection to the proper amount will improve the riding of the entire car. With the loads which are to be carried established, there is a suitable and proper deflection for the springs to take. To give them less deflection than is proper will make the car ride "crankily." This will become more apparent as the speed is increased, especially in the rear springs. Having found the happy medium, there will be no room for argument.

There is a wide difference in the action of the front and rear springs. The front spring, being the first to take the shock, has not only to meet it, but to carry the force of the entire load, driven by the power and momentum of the car. To do this successfully the deflection must be less than would otherwise be necessary. When the rear wheels strike the obstruction the load and the momentum are an aid to the spring itself.

The reaction of a spring is determined by its length and is approximately uniform. The shape of the spring has as much to do with its reaction as anything. With excessive camber the reaction will be sharpest, while a flat spring will be lazy by comparison. Friction between the plates, the type of spring and its proportions all have their effect. The amount of deflection will fix the time of the reaction, but the speed at which the spring moves will be fairly constant. If one had to consider only the reaction, designing a suspension would be easy; all cars could be treated much alike; first determining the ideal reaction, then the proper dimension of spring to get this result, the problem would be solved. But what is satisfactory when applied to one car may be disappointing when applied to another. If the spring is of the proper dimension for the car, and working at the proper deflection, the reaction need not be considered seriously. Its chief value lies, therefore, in determining the proper spring for the car.

A half elliptic spring is at its highest efficiency when the center-bolt is on center. In front springs it is customary to offset the center-bolt slightly to the front, so as to take the road shocks better. There is some tendency to carry this offset to an extreme, usually to secure a longer wheelbase, but this is a mistake. The front spring should be offset very little. In the case of rear springs it is always best to have the center-bolt on center. Where the front end is used as a driving

*Designing engineer, Kalamazoo Spring & Axle Co.

A paper read at the semi-annual meeting of the Society of Automobile Engineers, June 14-17, 1915.

member, the rear spring may be offset slightly to the rear, more to reinforce the driving end than from any real necessity.

In three-quarter elliptic and platform springs, the front portion of the spring should have a deflection equal to the deflection of the two rear portions combined. Unless this general proportion is maintained, it will be found difficult to secure an efficient deflection of the entire spring without over-stressing some part, or producing a rocking motion in the spring-seat, which is unsatisfactory.

A spring in action will deflect each way from the carrying point the same distance it has deflected from its normal position to that point, plus an additional amount for "slam" under extreme conditions. The cantilever spring seems to be an exception to this rule, in that it almost never takes any slam. The other types of spring will take a slam in greater or less degree according to their type; the half elliptic the least, the platform slightly more, the three-quarter elliptic still more, and the elliptic the largest amount. It will thus be seen that for a given deflection a car can be hung lower on cantilever springs than on any other type. With other types additional clearance must be provided according to their characteristics.

A spring is at its best when it is horizontal and the master plate is straight. It will take the shocks of the road better, will be found steadier, its action will be lazier, and the car will pitch less. My experience is that it will have slightly greater capacity when being deflected beyond a straight line than when being deflected to that line.

Nothing is gained by using a narrow spring. Within reasonable limits the wider the spring the more steadily and more satisfactorily the car will take the road. Piling up the number of plates to get the required capacity is expensive. A spring of this type seldom maintains the full capacity of each individual plate. A simple rule can be depended upon to give good results. Where the spring is thicker at the thickest point than it is wide, it is desirable as well as economical to increase the width and reduce the thickness.

A spring must serve part or all the following purposes: It must be a connecting link between the axle and the frame. It must carry the load. These two are always necessary. It must often serve as a driving member; common usage has made this standard practice. As if all these were not enough, there seems to be a growing tendency to require it to take the torque of the brake. It is too early yet to determine whether this latest use will be accepted as standard practice. I venture the suggestion, however, that it seems like trying to ride a free horse to death.

When a spring is to be used as a driving member it is desirable to compromise a little in the deflection to secure a more steadily running car. If it is also required to take the brake torque, the deflection should be still more reduced to aid the spring in taking this added strain. Where a three-quarter elliptic or a platform suspension is used either as a driving member or to take the torque, the general design of the suspension should be modified to better balance the action of the springs. In such cases, as a general rule, the less of the total deflection that is taken by the scroll member or the cross spring, the more steadily the car will ride, the "truer" the springs will drive, and the more effectively they will take the torque.

In designing a spring suspension the first thing to determine is the maximum load each spring must carry. The character of the service that will be required should be next considered. If the work is to be confined to the first two uses mentioned above (connecting link and carrying agent), the range of choice is wide. Any type is practical. If the spring has to serve as a driving member, the field is at once narrowed. The scroll elliptic is impossible. The full elliptic while being used in a limited way is not thought very desirable. If the brake torque be added, the field is again reduced. The cantilever is eliminated and the full elliptic will not be seriously considered. In some recent development work two cantilever

springs on each side, one over the other, either parallel to each other or so arranged as to form a truss, are being made to drive the car and take the brake torque. While some of these ideas look good and seem feasible, the experiments are too new to permit of a definite conclusion as to their value.

Without question the half elliptic spring is the most desirable type for use under all the conditions stated. While both the three-quarter elliptic and the platform springs have their friends, and are being used to a somewhat limited extent, I question whether they will ever come into general use. It would appear that the half elliptic spring will have this particular field practically to itself.

It is essential for best results to maintain a proportional deflection between the front and rear springs. If the deflection of the front spring is proportionally too great, it will affect adversely the riding of the whole car. If the deflection of the front spring is proportionally too small, while the effect will not be so noticeable as in the other case, the suspension as a whole will not measure up to what one has a right to expect. As between the two extremes, however, it will be found better to hold the spring below the ideal deflection rather than above. This will be especially true if any considerable speed is to be made. As the weight it is to carry determines the proper deflection of the rear spring, and the deflection of the front spring should be determined from the deflection of the rear spring, the rear suspension should be laid out first. Having reached this far, the rest will be easy.

It may not be out of place to call attention to a common practice. The spring suspension is seldom considered before the axle and the frame have been selected. While it is possible to make a spring that will fit into almost any place within reason, it often happens that to do so means reducing its efficiency, and added cost which could have been avoided easily if the spring had been considered first. What is desirable in the way of drop of the front axle and the shape of frame is determined from the spring. A slight modification for the purpose of improving the suspension is usually entirely feasible if considered in time. What might appear to be very minor changes in either the openings or dimensions may mark the difference between an excellent suspension on the one hand and an ordinary or indifferent one on the other.

It is manifestly impossible to deal with spring design in other than general terms. It is unfortunate for the car designer and the spring maker as well that this is so. While the method of procedure may be simple and clear, the possible combinations are so many and the divergence of views is so great that it is necessary to consider each car individually to even approximate ideal results. I have never been able to follow any hard and fast rule in designing. Even where the suspension may seem well nigh perfect theoretically, it is not unusual to have to make changes to meet peculiar conditions which may be entirely lacking in the next car.

DETERMINATION OF CRIMP IN TIRE FABRICS

In testing tire fabrics the length of each warp and filling yarn used up in passing successively over and under other yarns is an important factor. This is called "crimp." As a satisfactory method has not existed for determining "crimp," the Bureau of Standards has undertaken to develop such a method. The one proposed, which promises success, consists in measuring a thread in cloth, removing, and again measuring under various tensions. The results enable the length of the yarn under no load to be computed and from this length and the length in the cloth the "crimp" may be computed.

EXTENSION OF TIMKEN PLANTS

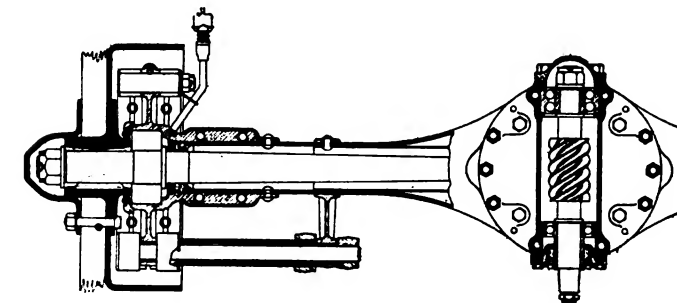
The Timken Roller Bearing Co., Canton, O., will shortly begin the erection of a cold drawing steel plant. The plans call for the erection of a building 100 x 300 feet, and it is expected that additional units will be erected later.

NEW SHELDON WORM GEAR AXLE

Designed for Trucks of 1,000 Lbs. Capacity—Special Steel and Bronze Used for Worm and Worm Wheel

The Sheldon Axle & Spring Co., Wilkes Barre, Pa., after over a year's testing of a new design of worm gear axle, for delivery cars of 1,000 lbs. capacity, are now ready to furnish this type of drive for such cars. The company has installed all necessary machinery and equipment for the manufacture of the new axle and announces that a large order has already been placed by a firm manufacturing delivery wagons of 1,000 lbs. capacity, which will sell for less than \$900 with full equipment.

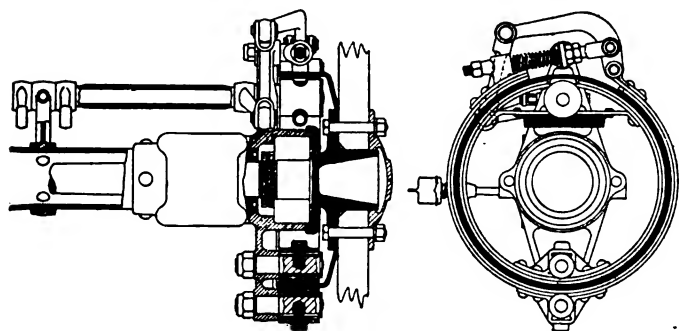
The new axle is of a design similar to the larger Sheldon worm axle and incorporates the straight type of worm and wheels in semi-floating construction, which produces a simple axle of relatively few parts and light weight. The housing is pressed steel and is pressed and riveted to cast steel spring



Plan section, showing mounting of hub on axle shaft by means of taper bushings, permitting the wheel to be easily removed

any distortion that might have taken place during the heat treatment. As the grinding is done to within close limits, the finished worms are all of a size within very close tolerances, permitting of perfect interchangeability at this point. The worm has five starts, 3.75 lead, 30 degrees 50-minute lead angle, 30 degrees axial pressure angle, 26 degrees 22.5 minutes normal pressure angle.

A special formula is also employed for the bronze worm wheel which has 31 teeth of 1.75-inch space. Both the material in the worm and worm wheel have been selected as the result of long experiment, and both the material and the heat treatment accorded are kept as secrets by the manufacturer.

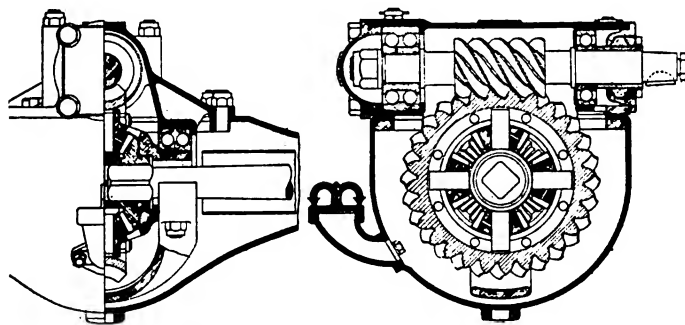


Double internal cam brakes used with the new Sheldon worm gear rear axle. Shoes are malleable iron and drums of pressed steel

seats and brake spiders. A special feature, as shown in the illustrations is the mounting of the hub on the axle shaft by means of taper bushings, permitting the wheels to be easily removed without the aid of a wheel puller.

Double internal cam brakes are used 1.75 inch wide operating against 14-inch pressed steel brake drums. The internal brake permits of a clean exterior appearance as all the parts are housed within the drum where they are also protected from mud splashed by the wheels. The shoes are malleable iron lined with Thermoid, and the arrangement has been so designed as to permit of the use of non-skid chains without any danger of interference with the brake lever. The latter are extended inside the frame and are mounted in hardened and ground bushings which are amply provided for in the way of lubrication.

The axle shafts are two inches in diameter at the outer bearing and are tapered from the bearing collar to the differential to provide a uniform stress at all sections of the shaft. The materials used are 3.5 per cent. chrome-nickel steel drop forged. They are heat treated to give an elastic limit of 125,000 to 150,000 pounds per square inch.

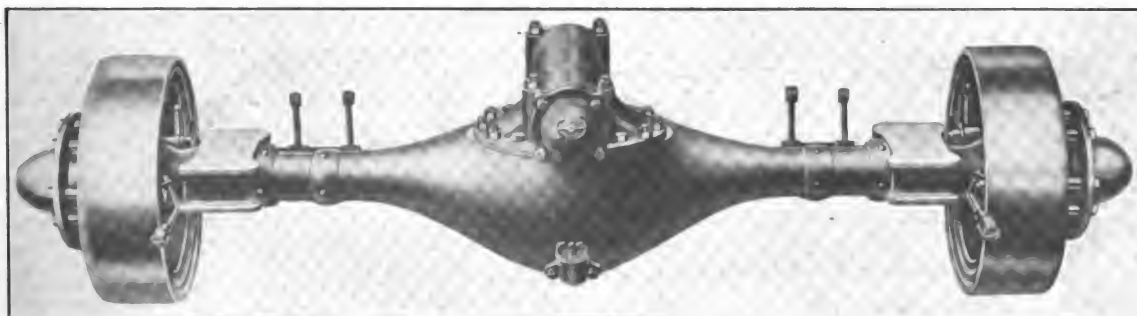


Vertical sections through new Sheldon worm drive rear axle

A forging is used for the differential case and the differential gears and pinions are heat treated alloy steel.

Special attention has been paid to the bearing mounting of this axle in order to keep the frictional resistance as low as possible. Ball bearings are used throughout and as will be noted the design has been such as to keep frictional resistance as low as possible and at the same time provide a large factor of safety in the bearing mounting.

The new axle is a complete, high grade equipment for the light truck of approximately one-half ton capacity.



New Sheldon worm gear axle

WHAT AILS BUGGY TRADE?

I have just returned from quite a trip through some of the western states, writes Observer, in *Implement Dealers' Bulletin*, and thought possibly your readers might be interested in knowing what conditions I found in regard to the vehicle business. I am prompted to write the *Bulletin* concerning this because of the interest it has taken in this particular matter in recent issues.

In some places the dealers seem to have lost all heart in trying to sell buggies, while in other places they are pushing hard for business and are selling lots of buggies at good profits. For example: at one town the dealer had a job lot of 10 or 20 duty out of date buggies and complained that the automobile and motorcycle were hurting his trade. At the next town, 12 miles distant, the dealer said that the automobile did not hurt his buggy trade as he has sold 27 buggies so far this spring. This particular dealer is pushing rubber-tired buggies and in several cases has taken in motorcycles in part payment on new buggies.

At the third town the dealer complained that the automobile is hurting his trade. He had three shop worn, dusty buggies in stock, which he thinks will be enough for this season's trade; yet the dealer in town No. 2 sells buggies beyond town No. 1 and town No. 3. He has a fine stock of buggies in a fine place and they are kept up in excellent condition and this dealer seems to be making money out of the buggy business.

In nearly every case where the dealer complained that the automobile is hurting his business he had a poorly sorted stock of buggies, out of date and dusty, and was either handling automobiles himself or owned one.

I found many dealers who were of the opinion that the automobile is not a practical proposition for the farmer and that the buggy trade will come back in fine shape. Some dealers are living in the present and are pushing the sale of buggies with splendid results. I believe that it is a pretty safe bet that when a dealer complains that the automobile is hurting his buggy trade that a little investigation will show that some dealer in the same town, or a nearby town, is having a good buggy trade and is doing most of the buggy business in the locality. If this is not true, then the chances are that a close watch of the railroad depots would reveal the fact that the mail order houses are profiting by the inactivity of the dealer.

I can only come to this one conclusion, namely, that the dealer who will push the buggy trade is going to sell a goodly number of buggies at good profits, while the dealer who throws up the sponge is missing a good opportunity for making some money, and is also making it easy for the mail order house to sell the buggies. I believe that what the dealer needs right now more than anything else is a liberal dose of ginger.

I have some business calling me to two or three of the western states again within a month or two and I shall make some observation and if your readers are interested, will be glad to write you what I find.

J. M. STUDEBAKER WILL BE ELECTED HONORARY HEAD

President Fish Announces Impending Changes to Be Made in Officers of Studebaker Corporation

Several changes in the officers of the Studebaker Corporation are being contemplated according to a statement given out by Frederick S. Fish, president of the concern.

The most important of these will perhaps be the election of J. M. Studebaker as honorary president with the same powers and duties that he has now as chairman of the executive board.

The changes contemplated are as follows:

Mr. J. M. Studebaker to be elected to the position of honorary president of the corporation with the same powers and duties which he now has.

Mr. Fish will be chosen as chairman of the board, with the same authority, supervision and control as he has at the present time.

The office of first vice-president will be abolished, and A. R. Erskine will be chosen as president of the corporation.

Mr. Studebaker is 83 years old, but in spite of his advanced years each morning has found him at his desk.

Mr. Studebaker and his brothers founded the great wagon works known for years as the Studebaker Bros. Manufacturing Company.

A special meeting of stockholders for the purpose of voting on amendments to the company's certificate of incorporation changing the terms of directors has been called for July 7 at Jersey City, N. J. The change contemplates the classification of directors into five groups of equal number and for the election of one group each year.

Mr. Studebaker's brothers all are dead. Clem died in 1901, Henry S. in 1895, Jacob F. in 1887 and Peter C. in 1897. All were active in the business in the old days. George M. Studebaker, of South Bend, one of the younger generation, is a director of the corporation, but has no executive office.

Mr. Studebaker still is hale and hearty and takes a keen interest in the manifold affairs of the corporation.

BUCKBOARDS FOR HONDURAS

The two-wheeled oxcart is about the only vehicle of common use in Honduras, according to Consul Ezra M. Lawton, of Tegucigalpa. The years of mining operations and the campaign for road building by the government has brought American iron wheelbarrows into common use. The 90-mile highway from San Lorenzo (Pacific subport) to Tegucigalpa has popularized the automobile, and there should be a market now for light wagons or buckboards.

More roads are being built each year. Until the last few years only mule trails existed. Ranchmen and travelers have fallen into the habit of traveling on mule back, but in some parts of this section the necessity no longer exists. The Department of Choluteca is a rich agricultural section bordering on the Bay of Fonseca, where much of the country is comparatively level. It is suggested that manufacturers start a campaign among the wealthy stockmen of that section for the sale of light wagons. The ideal vehicle for all-round use is a four-wheeled buckboard with an umbrella top that can be unshipped when it is necessary to drive under low trees.

It is suggested that manufacturers issue a small circular or folder devoted only to buckboards and light wagons for two horses. Single carts will not do, as the ascents are too heavy and roads, where rough, are so worn that a double team is required for properly tracking the wagon. There is appended to this report a list of prominent ranch owners around Choluteca and the name of an American ranch owner who would be willing to take the agency for a good buckboard. (These names may be obtained from the Bureau of Foreign and Domestic Commerce or its branch offices.) The American ranch owner has agreed, if given the agency, to demonstrate a sample vehicle among all the presons listed, who own no vehicles of this sort and few of any sort, except for freighting. Correspondence and literature must be in Spanish.

Later this trade would naturally develop toward Tegucigalpa and along the highway mentioned.

THE RUBBER SHORTAGE IN GERMANY

In view of the shortage of rubber, the German government, it is stated, is offering a prize of 100,000 marks to the inventor who devises a satisfactory process of regenerating rubber. Similar incentives are also offered for new motor fuels, while the shortage of lubricating oil is to be overcome by means of a new system of lubrication, the details of which have not yet been officially published by the government.

THE NEW APPRENTICESHIP

The problem of training the industrial worker is not a new one. England had this problem as early as the beginning of the fourteenth century and by the middle of the seventeenth century she had developed a system of industrial training which in our own time has never been surpassed.

When in that day children left their homes to enter industry they exchanged their services for instructions. The youthful worker was bound to his employer by a contract which asserted the rights of the learner on the one side, and on the other the responsibilities of the employer, who stood in loco parentis to the child. This contract stated the number of years the apprentice was to serve; pledged the master to give thorough instruction in every branch of the trade; and made him responsible for the obedience and good conduct of his ward.

Children who faithfully served their indenture were virtually certain of after employment in the trade in which they were trained and a permanent career, since apprenticeship led to journeymanship and conferred upon the apprentice at the successful completion of his term the rights and privileges of a free citizen.

The Statute of Artificers in 1682 gave this system a national stamp by making it a universal and compulsory method of training for the skilled trades throughout the realm. To assist in enforcing this decree the government called upon the guilds, which were powerful brotherhoods of proved craftsmen organized to control and protect the trades. Guild rules supplemented the law and guild officers, supported by the law, exercised a general supervision over the daily life and training of the apprentice both in the workshop and in the master's house where he was lodged.

This not only gave to England a system of technical training such as we have not known since the decay of apprenticeship but also minutely regulated over a large area of industry the conditions of juvenile employment. And this was developed in the centuries when opinion was probably hardest towards youth and the public conscience was not yet aroused to the evils of child labor.

In the latter half of the seventeenth century the guilds became unable to enforce apprenticeship with their former vigor. The growth of the spirit of individualism and the doctrine of laissez-faire brought fierce opposition to the prestige and authority of the guilds on the part of free traders who set them at defiance. With the decline of the guilds and the growth of capitalism began the dissolution of apprenticeship. Even before the repeal of the statute of apprenticeship in 1814 systematic technical training in England had well-nigh disappeared. And with it disappeared the regulation of juvenile labor for which the apprenticeship system was sponsor.

Reorganization of the industrial world upon modern lines not only caused a breakdown in the regulation of child labor, but in various ways materially altered the character of that labor. Hitherto, in the skilled industries at least, child labor had been subsidiary to adult labor but with the introduction of machinery it became independent. Children for the most part no longer worked as assistants to master craftsmen but as principals. With the development of machinery the demand for juvenile labor during the last hundred years has so greatly increased, and the number and variety of child employment so rapidly multiplied, that the beginning of the twentieth century finds large armies of children engaged as wage earners on their own account in a wide variety of occupations which afford no fitting preparation for adult employment.

Meanwhile, industry in its struggle for the markets of the world is feeling more and more the press of competition and begins to call for properly trained workers.

This, briefly, is the story of industrial training in England. In close parallel to this is the story of apprenticeship and child labor in America. Today both nations find themselves facing the same problem, that of the training and conservation of the worker in industry.

We, in this country, says W. A. O'Leary, of the U. S. Bureau of Labor Statistics, have made but little progress towards a comprehensive solution. It is obvious that we cannot restore the old apprenticeship. The modern organization of industry and society will not admit of such a system. We have accepted the principle of the regulation of child labor and are rapidly enacting legislation. In many places we are also developing schemes of industrial training, sometimes by the public school alone, sometimes by the industry, occasionally by both in co-operation.

Undoubtedly the final solution may mean many types of schools organized in many ways. No far-reaching program can be devised, however, until we have returned to the spirit of apprenticeship and have established a co-operation between the employer and the school in which each shall recognize and discharge his responsibility; until we have, in this sense, developed a "new apprenticeship."

An interesting example of a public school based upon this kind of co-operation is the Beverly, Mass., Industrial School. This school was established by the city in 1909. The ordinance creating the school places the control in the hands of a board of trustees appointed by the mayor of the city and composed of five members of the Beverly school committee, the mayor, and one representative of each industry entering into the plan of co-operation provided in the ordinance. Every detail concerning the management of the school, including the selection of pupils, course of study, and hiring of teachers, is in the hands of trustees.

The only industry, up to the present time, that has entered into co-operation with the school is the United Shoe Machinery Co. Under the terms of this co-operation the company furnishes a shop in its own plant equipped with all the tools necessary for thorough training in the machinist's trade. This department is operated independently. The United Shoe Machinery Co. furnishes the raw material for the work to be performed. This it sells to the school as to an outside concern. The company then purchases at established prices all finished product which meets the required standard. If the earnings of the school shop fall below the cost of maintenance the deficit is made up by the company.

The city of Beverly provides a school building, salaries of the director and instructors on duty at the school building, and all other forms of maintenance not included above. The funds for this are raised in the same manner as the funds for the regular schools of the city.

The ordinance further directs that the trustees shall conduct all the affairs of the school in such manner as to receive the approval of the State Department of Industrial Education in order that the city may be entitled to reimbursement from the state treasury. This the trustees have always done.

Pupils alternate weekly between the shop and the school room. While in the shop they are paid on a piece rate basis for all work passed by the company inspector. At the same time they are given thorough and systematic instruction in every branch of shop work pertaining to the trade. No boy is exploited. In the school room the pupil continues his general education besides receiving training in citizenship and trade theory.

The boys are not indentured. No necessity for indenture has appeared. The pupils are not employees of the company but wards, as it were, of the trustees who exercise over their industrial training the same supervision as did the guilds in the days of the old apprenticeship.

The significant thing about this school is not that it is a type which will be widely copied. In that sense it is not a large contribution to the whole problem of industrial education. Nor from this standpoint is its peculiar efficiency important. Its significance for industrial education lies rather in the spirit in which a great industry has joined hands with the public school and accepted the responsibility for its share in the training of the worker for industrial efficiency and citizenship. It points the way to what industry everywhere must do

before we can reach in any large sense a solution of the problem of industrial training.

It is because of this peculiar significance that the United States Bureau of Labor Statistics through the courtesy and co-operation of the United Shoe Machinery Co. and the State Board of Education of Massachusetts secured a motion picture of the Bureau's exhibit of industrial training at the Panama-Pacific Exposition.

VALUE OF COLOR IN HORSES

The question is often asked concerning the value of coat color in horses. There seems to be among some breeders the idea that strength of endurance goes with the color.

There is no semblance of truth in the traditional ideas of this nature. There is no evidence that points of value are in any way connected with the inheritance of coat color. The factors or determiners which control the transmission of color, so far as we have been able to discover in this study, are independent of all other qualities. The color of itself is no indication of a good horse or of a worthless one.

It is usually considered that black color is the one essential for a mule, but some of the best spans of mules in central Kentucky are gray, while at least one most valuable is dun.

The statement cannot be made too emphatic that speed, intelligence, vigor and other good traits are inherited independently of color. While it is true the color is no indication of the real value of the horse there are those who care for one color more than for the others. This is true when spans or pairs are needed. It is imperative that they be of the same color and the same shade of color if they are to be matched. There should be no very great difficulty in breeding horses for any desired color.

The laws governing the heredity of colors promise to be of the greatest value as an indication of the method for further research for the laws controlling the transmission of gait, speed, style, conformation, intelligence, stamina, docility and all the qualities which add value to the horse. The present study at least shows that the breeding of horses can be put upon a more scientific basis. There are small bodies of chromosomes in the germ cells which determine what the color shall be. It is only a fair inference that there are similar determiners in the germ cells for the transmission of every valuable trait. The future studies must be directed to the discovery of the laws which govern the inheritance of desired qualities. The physical basis of heredity rests in the small bodies, or chromosomes, within the nucleus of the germ cells. There appears to be a separate body for each quality whether it is from man's viewpoint, good or bad. The physical basis for traits are called factors or determiners. Each factor or determiner controls one quality called a unit character. The horse, like all complex living organisms, is made up of unit characters, some desirable, some undesirable. For man something like 2,500 traits or units have been catalogued. The laws governing the transmissions of many of the human traits have been formulated.

Our studies show the colors of horses to be unit characters and that they behave as simple Mendelian units. That is, they do not blend so as to lose their identity; but the weaker or recessive ones disappear altogether in the external appearance of the horse, while the factors for them remain latent in the germ plasma. We call gray dominant because a pure-bred gray mated with a bay, black or chestnut, will invariably produce a gray foal. While a gray foal will always come from such a mating, the foal will be a hybrid gray and part of its germ cells will contain the factor for gray and a part for the bay, if the other parent was a bay. In the mating of hybrid grays, germ cells may meet, both of which contain factors for bay and a bay horse will result. The bay color thus coming from two hybrid grays illustrates the behavior of a recessive. It recedes in the presence of the gray to reappear in a later generation.—Kentucky Experiment Station.

GERMAN AGENTS CONTINUE TO BUY AMERICAN HORSES

Representatives of all of the principal nations at war in Europe are combing the west for horses for the armies. Several of the horse buyers bear titles; the majority of them are men who have been at the head of great establishments in Belgium and France, which formerly supplied America with draught horse stallions. One who was recently in Lincoln was drawing \$2 a day and expenses for his work. Before the war he drew \$10,000 a year as manager of a great breeding stable in Normandy.

How the few German buyers get their purchases through is a mystery, and they refuse to elucidate. They make it plain that that is their own business and they keep on buying. Woods Bros., Lincoln, Neb., the largest dealers in that section, have been asked to bid on a 25,000-head shipment for the German government, payable by drafts on New York.

In the beginning speculators and business men jumped into the game, taking large contracts or sub-contracts. The ruling prices for the grades desired were \$150 and \$175, subject to inspection, which was very rigid, and a large portion of each shipment was rejected. Rather than carry these back to the west the dealers sold them at the points of shipment for what they could get.

That there are horse traders in Europe and dealers with sharp eye teeth was proved by the fact that a number of these rejected animals were shipped to Europe, the purchasers being government agents, who took this means of showing American dealers some tricks in horse buying, purchasing in the guise of contractors who desired the animals for the northwest.

The fact that the greater part of the supply in the west has already been purchased or is in the hands of speculators holding for the raise they feel certain will come with a continuance of the war has led to a letting down of the inspection bars. Hundreds of animals that formerly would not have received a second look are now going through. The stable boys say that the fat ones are given the preference. Their theory is that after they have been shot they make good eating for the men in the trenches.

White and gray horses are taboo because they are shining marks on the battlefield. The one thing the buyers are particular about is the wind. They require swift galloping for a block or two before the inspector decides. As the average life of a horse at the front is but a week, style, age and form are not regarded as essentials. For the cavalry arm the bigger horses of the buggy type are favored, while for the artillery the farm work horses and the culls from the draughting stables are purchased. Few mares are sold, as these are too valuable for breeding purposes on the farms.

Fear of the German spy system permeates all of the stables at the big buying centers like Omaha, Kansas City and Sioux City. Sentries armed with pitchforks halt all strangers, and none can get past until he shows credentials. Every time there is a fire—and these are of frequent occurrence because of the penchant of the stablemen for a pipe—it is suspected that some German spy has been around. So the inspection pens are kept guarded.

SOUTHERN WAGON MANUFACTURERS MEET

On June 9 the Southern Wagon Manufacturers held a meeting at Old Point, Virginia, to discuss the standardization of wheel heights, gears, tire width and track, and to hear reports from various committees which had been appointed to investigate these subjects.

"Work along this line is necessarily slow in progress," says Secretary B. P. Thornhill, in a recent communication, "but we are making some headway, and hope to be able to accomplish results that will be beneficial to the manufacturers, dealers and users of wagons."

ARGENTINA AS A MARKET FOR AUTOMOBILES

American-made automobiles are steadily gaining in popularity in the Argentine market, their proportion of the total imports of automobiles into that country having risen from 10½ per cent. in 1912 to more than 19 per cent. in 1913, the latest period for which detailed official returns are available.

The imports of automobiles into Argentina during 1913 were valued at \$5,194,200, supplied chiefly by France, the United States, Germany, Italy, the United Kingdom and Belgium, in the order named. While France still ranked first in the importation of automobiles into Argentina in 1913, the United States made a larger actual and relative gain than any of the countries named and rose from fourth place in 1912 to second place in 1913. In 1914, when the world-wide depression reduced the value of automobile imports into Argentina to about one-fifth of their normal total, those from the United States also decreased, the exports of automobiles from the United States to Argentina and other countries of South America in that year being a little over one-third of those of the preceding year.

The imports of automobiles into Argentina during the last four years were as follows: 1911—2,461, valued at \$2,346,600; 1912—4,281, valued at \$5,159,000; 1913—5,115, valued at \$5,194,200; 1914—2,185, valued at \$1,105,700. The following table shows the imports from the most important countries of origin in 1912 and 1913:

Imported from	Number		Value	
	1912	1913	1912	1913
France	1,651	1,830	\$2,252,800	\$1,914,900
United States	708	1,296	544,000	1,003,600
Germany	627	761	822,300	848,800
Italy	422	425	547,200	492,500
United Kingdom	451	412	430,500	471,800
Belgium	295	302	433,900	351,200
Other countries	127	89	128,300	111,400
Total	4,281	5,115	\$5,159,000	\$5,194,200

Exports of automobiles from the United States to all countries increased from 3,291, valued at \$2,833,154, in April, 1914, to 5,345, valued at \$8,045,222, in April, 1915. This growth was almost exclusively in commercial automobiles, of which the exports rose from 52, valued at \$72,676, in April, 1914, to 2,267, valued at \$5,240,481, in April, 1915. About half of these commercial automobiles went to France and the remainder chiefly to England and other European countries. In the ten months preceding May 1, 1915, exports of passenger automobiles aggregated 14,641, valued at \$12,356,472, as against 23,167, valued at \$20,664,480, in the corresponding period one year earlier; while those of commercial automobiles numbered 8,580, with an aggregate valuation of \$23,977,968, compared with 595 valued at \$934,330, in 1913-14.

FORTUNES SPENT IN ADVERTISING

"\$600,000,000 was spent for advertising in the United States in 1914!" This is the estimate of William Woodward, president of the Associated Advertising Clubs of the World, made in an address before the Chicago Association of Commerce. The story of this expenditure and the results achieved will be discussed at the Chicago convention of the Associated Clubs, June 20 to 25.

What this discussion means to the advertising fraternity is evident from advance reports concerning the movement on Chicago by the armies of advertising men which have been and are being organized in all parts of the country. A veritable invasion is at hand, an invasion which purposes to spike the guns of objectionable advertising.

T. W. LeQuatte, president of the Associated Advertising Clubs of Iowa, startled the brisk hotel clerks of Chicago when he made reservation at the Sherman for a regiment of 1,000. Close upon this followed reservations for 200 members of the Pilgrim Publicity Association of Boston at the Congress Hotel, and the same number for the Advertising Men's League of New York. The Poor Richard Club, of Philadelphia, engaged

an entire floor at the LaSalle, where the Indianapolis Club has reserved 50 rooms. The National Association of Advertising Specialty Manufacturers has made reservations at the Hotel Sherman for 50 members. From Fort Worth will come a special train bearing the Texas clubs. The Pilgrims expect to have a special train, while many clubs are planning on one or more cars.

But the invasion will not be by land alone for the Grand Rapids Advertisers' Club has chartered the steamer "City of Grand Rapids" at a cost of \$10,000 for the convention. It will take to Chicago a record convention crowd from the Michigan city, the members of this delegation living on the boat while there.

There was jubilation among the leaders of advertising when Mayor Thompson signed a proclamation making June 20 to 26 "Advertising Week" in Chicago. He called on merchants and citizens not only to welcome delegates to the convention but also to display during the week, advertised, trade-marked merchandise and to decorate their places of business.

Arrangements have been made with the Essanay Film Corporation to chronicle the convention from the first day, and on the last evening of the gathering the delegates will have the opportunity to watch themselves re-enact the events of the big convention.

TO COACH FROM NEW YORK TO WHITE PLAINS

Prompted by a desire expressed by his friend Mr. Alfred G. Vanderbilt, for a revival of the coaching sport in this country, just a few days before he sailed on the Lusitania which had such an ignominious ending to its voyage, Mr. John McE. Bowman, president of the Biltmore Hotel, New York City, proposed a plan to carry out to some extent the interest in this greatest of all driving pastimes.

Mr. Vanderbilt told Mr. Bowman just before he sailed that he had hopes of bringing back to America from England some of his coaching horses for the purpose of reviving the sport in Newport where he had planned to spend a good part of the season.

Although it will be taken up on a much smaller scale, coaching will be revived in New York and probably in Newport by some of Mr. Vanderbilt's friends who are enthusiasts of this sport, during the season.

Beginning on Friday morning, May 14, at 10 o'clock, the coach "Liberty," owned by Messrs. James Gordon Bennett, and James Hazen Hyde and driven on different occasions by the late Mr. Alfred Vanderbilt, started from the Hotel Biltmore and will continue to make a daily trip to the Gedney Farms Hotel in White Plains.

Miss Harriet Alexander, daughter of Mr. and Mrs. Charles B. Alexander, and one of the most expert amateur whips in this country, booked the coach for the first day's run.

HORSE-DRAWN VEHICLE DOMINATES

As a proof that horse-drawn vehicles still predominate on city streets and country roads, here is a clipping from a recent issue of the Chicago Tribune, which reflects vehicle conditions in that city:

Traffic of all kinds in the downtown loop district of Chicago is more congested than in any territory of equal extent in the world. People who have noticed that it requires an increasing amount of ability to get around the streets may well keep their eyes and legs in training. Conditions are certain to get much worse before they improve.

The number of automobiles on the loop streets have increased 60 per cent. in the last five years. That would naturally be supposed to mean that the number of horse-drawn vehicles had correspondingly decreased. Unfortunately for the peace of mind of pedestrians exactly the opposite is true. A census made by the officers of the traffic squad, shows that within the

last two years the number of horse-drawn vehicles has increased by 30 per cent. Every day 80 000 tons of freight are trucked through the loop.

The same census shows that every day there are 130,000 teams moving through some part of the district bounded by Twelfth street on the south, the lake on the east, Chicago avenue on the north, and Halsted street on the west. Good, old, faithful Dobbin is very far from being turned out to pasture.

THE MOST FERTILE FIELDS OF INVENTION

	Patents
Carriages and Wagons.....	37,728
Clasps, Buckles, Buttons.....	18,772
Harvesters	15,006
Plows	15,907
Mills	18,803
Machine Elements	15,062
Builders' Hardware	15,826
Games and Toys.....	12,164
Locks and Latches.....	11,930
Mills, Grinding, etc.....	18,803
Railways	11,347
Railway Rolling Stock.....	15,462
Seeders and Planters.....	11,059
Water Distribution—Mains and Pipes, Cocks and Faucets, Pipe Couplings, etc.....	21,592
Wood Working	10,060
Locks and Latches.....	11,930
Washing Machines and other laundry appliances.....	11,385
Buckles, Buttons and Clasps.....	18,772
Steam Engines	11,907

Some of the Most Prolific Inventors

Edison	977
Elihu Thomson	617
Francis H. Richards.....	847
Edward Weston	299
Charles E. Scribner.....	437
George Westinghouse	340

AN ENGLISH VIEW OF THE JITNEY

The following quotation is from a breezy editorial in the April issue of the Electrical Times of London, commenting on a recent article released by the Electric Vehicle Association of America on "Electrics in Omnibus Service." It gives an English view of the present "jitney" craze:

"In an article by Mr. A. J. Marshall, secretary of the Electric Vehicle Association of America, the Electrical Times is much quoted and we have carefully read the argument. It is amusing to note that American bus and tramway people are just beginning to get cross with pirate omnibuses. Not infrequently 'jitneys' are operated by unscrupulous persons.' We know those persons well, they come fra' Sheffield. A 'jitney' is an independent guarillero. It selects what routes it likes, cuts in and out when it likes. In Germany it would certainly be verboten, and it even shocks the American sense of order, which makes for monopoly. It should not be forgotten, however, that once upon a time every public vehicle was in certain ways a 'jitney,' and that the time is not yet ripe for turning transport into a state of municipal monopoly."

WHY WAGON BUILDERS ARE BUSY

Many of the accidents in our large cities to wagons, trucks and drays are unavoidable, but because of accidents and hard service and the increase of traffic the business of horse wagon and motor truck repairing is assuming large proportions.

A horse wagon or motor truck requires naturally more repairing than a carriage, because of its rougher usage and in some cases because of less attention and improper care.

It seems that new wagons are not in extraordinary demand, but in general the repairing of all kinds of vehicles is on the increase, a condition which can be relied upon to continue.

No matter how carefully wagons and trucks are built, they are constantly put to such a strain that they wear and break

and call for repairs, which must be done quickly; for the owner needs his wagon to do the hauling, while the horses and driver will be idle in the meantime and no other wagon may be at hand to replace it.

Repairing demands call for immediate attention, and those shops which are best fitted up for quick work enjoy the best repairing trade.

THE JITNEY IN CANADA

Reports for the first quarter of the year indicate that the Vancouver city treasury will indirectly feel the effect of the reduction of travel over the city lines of the British Columbia Electric Railway resulting from the jitney bus traffic. The indications from the percentage payments of the company for the first quarter of the year are that the city will receive as its percentage on the gross receipts of the tram lines during 1915 from \$30,000 to \$35,000 less than last year.

This decrease is largely due to the operation on the city streets and suburban lines of 350 jitney busses, which are carrying the majority of the passengers who formerly rode on the street cars.

SPECIAL CARS FOR WOMEN AND CHILDREN IN WINNIPEG

A modern five horsepower seven-passenger machine made its appearance in Winnipeg on one of the runs for the use of "women and children only." If the car is unoccupied or has one woman passenger only, and six men should hail the driver they would not be permitted to use this conveyance. Some of the most skilled operators are women, whose cars are more generously patronized than many of the men. This may be on account of their careful handling, or it may be gallantry.

It is reported that the street railway company has considered the advisability of taking legal action against the jitney association, based upon the alleged exclusive franchise of the company to carry passengers on the streets of Winnipeg.

The jitney service, so popular in the United States, has moved east in Canada from Vancouver and Winnipeg and is now successfully established in Toronto, and is also seeking to gain a foothold in Hamilton. After an experiment of a few weeks in a popular residential district not yet well supplied with street railway cars, the Toronto Jitney Association has placed motor cars on two important business thoroughfares, and the further experiment has proved so successful that the extension of the service is now under serious consideration.

PERFECTION SPRING ESTABLISHES SERVICE BRANCH IN NEW YORK

The New York Service Branch of the Perfection Spring Co., 243-245 West 64th street, will soon be prepared to take care of all forms of spring repairs, including tempering and resetting, and by that time will have a complete set of furnaces and equipment for such work. A. C. Bergmann, service branch manager, who was formerly connected with Simplex, Fiat and Mercer, has completed the installation of equipment to make it possible to change a spring in one-half hour, and already the service department is completely stocked with springs for different makes of cars covering models as old as 1909 and in some cases older types. By the fall the new building will be occupied which will be a three-story structure 75 x 100 and located at 610 West 56th street. The first service branch of the Perfection Spring Co. was opened in Cleveland a year and a half ago and it is expected that others in addition to the New York one will be opened in the near future.

LOZIER TO RE-ENTER AUTO BUILDING FIELD

Harry A. Lozier, who was the founder and head of the former Lozier Motor Co., from which he retired in 1912, has been at work on a new automobile organization for the past year

and a half. All facts about the car that is to be built, and about the men who are to be associated with him, are withheld for the present but the plant is to be located in Cleveland, O. Plans now contemplate a production for the first year of 3,500 cars.

Interviewed by a representative of *The Automobile*, Mr. Lozier made clear his reasons for wishing to withhold details at this time, but enough information was given to permit it to be said that he will again enter the manufacturing field with a most efficient organization, and with ample capital. None of it is to be put upon the market.

The design and full details of the car have been definitely settled upon.

CONDITIONS IN HARD WOOD TRADE

Improvement in the demand for oak, cypress, ash, hickory and other hard woods for shop and factory consumption was reported as the most important development in the Chicago lumber market recently.

The wholesalers reported that while conditions were far from normal, both northern and southern hard woods showed substantial gains, and inquiries for these stocks were more numerous than for some time past. The improvement is mostly from manufacturing cities throughout Illinois, Iowa and Indiana, although many of the local wood-consuming plants report improved conditions in various lines of retail trade and in consequence are increasing their output to meet the steadily growing demand.

Oak and hickory moved in good volume to the automobile factories, and the vehicle manufacturers also were in the market to some extent for these stocks.

FARMERS ARE BEST VEHICLE BUYERS

Builders of horse-drawn vehicles in all parts of the country are finding a constantly increasing demand for their products. Many factories are crowded for room and are planning additions to their plants, and from various sections come reports of newly incorporated companies which will engage in the manufacture of various styles of wagons, buggies, etc.

Whole thousands of vehicles of all descriptions are purchased, annually by city deliveries, yet the best customers of the manufacturers of horse-drawn vehicles are found among the prosperous farmers. Reports indicate that crops of wheat, corn, oats, potatoes, cotton, hay and tobacco will be far above the average this fall, and the optimism of the farmers has already shown its effect among the wagon and buggy factories of the land.—*The Horse Lover*.

AUTOMOBILE BATH WAGON FOR THE ARMY

The automobile bath wagon is something new both in automobile construction and in military use, but such a car has recently been built, to the order of the St. John Ambulance Association, of London, and sent to the front. This automobile is supplied with 12 folding bath tubs, made of waterproof canvas mounted on folding iron frames. When in use the tubs stand on the ground, six on each side of the car, in tents formed by drawing out a canvas partition that has been rolled up close against the side of the car, and which is supported by tent poles. Thus two compartments are formed, each about 8x10 feet in size, with the car in the center. A canvas floor covering is provided for each tent and hot and cold water, at the rate of two gallons a minute, are supplied from tanks through rubber hose pipes, while reasonable quantities of sterilized drinking water are also provided.

HORSE VEHICLE BUSINESS IS O. K.

American vehicle manufacturers and dealers are commencing to realize that the horse-drawn vehicle industry has not

been affected by the war, crops and politics in any greater degree than other staple lines of business, such as food, clothing, etc. They know that on January 1, 1915, the horse population of this country was 21,195,000 (not including the Missouri mule) at an average value of \$103.33, meaning an increase of 200,000 head for the year.

This would indicate that there is room for both the horse and the automobile in the general scheme of life, and that there is no question but what the horse will continue to remain the prime mover on the farm.

FORD STOCK EXCEEDS RIVAL BY \$18,000,000

When the stock dividend of the Ford Motor Co. is declared in July the outstanding stock of the Ford Motor Co. will exceed by \$18,000,000 the amount of outstanding stock of its nearest rival, in size, General Motors, with \$31,481,983 outstanding.

The Ford dividend, with the \$2,000,000 now outstanding, will make the outstanding stock of the Ford company \$50,000,000, which is held by eight people.

The authorized Ford capital is \$100,000,000, of which \$50,000,000 is to be kept in the treasury.

DEATH OF ROBERT HENDERSON

Robert Henderson, of Henderson Bros., Cambridge, Mass., one of the prominent firms of carriage manufacturers in the east, passed away on May 29, at his home in Cambridge, aged 77 years. He moved to Cambridge with his parents when young. His father established a carriage manufacturing plant and in 1856 Robert Jr. and his brother, John J., founded the firm of Henderson Bros. A short time ago the firm engaged in the manufacture of automobiles. He is survived by a widow, two sons, Francis and Charles F., who were associated with him in business, and one daughter.

FEDERAL RUBBER RUNNING OVERTIME

The Federal Rubber Mfg. Co., Milwaukee, Wis., has added 700 men to its force since the opening of spring. The plant is running overtime, and the total working force is 1,700 men.

About 60 per cent. of its product is automobile tires, and 40 per cent. mechanical goods. The company recently purchased six acres just north of its present plant, with a view to possible expansion. It is said to be contemplating the erection of a large factory building.

FLORENCE WAGON WORKS RESUMES OPERATION

The Florence (Ala.) Wagon Works resumed operations June 8 after a suspension of several months caused by the general business depression. The plant is running full time and giving employment to 100 men. The large surplus stock on hand at the time of suspension has been marketed and the resumption of operations was made necessary by new orders received.

HAYES EMPLOYEES BANQUET

About 60 employees of the Hayes Mfg. Co., Detroit, were tendered a complimentary banquet at the Hotel Cadillac on Saturday evening, May 8. D. K. Stephens acted as toastmaster, and addresses were made by heads of departments of the Hayes automobile factory.

WAGON PLANT RUNNING OVERTIME

The Lansing Wagon Co., of Lansing, Mich., is now running with a full force 12 hours per day. This necessitates a night run until 8.30 o'clock. The company will continue to operate its plant a part of the night for some time to come, according to the manager, Frank Thoman.

NEW CATERPILLAR TRUCK

The Allis-Chalmers Mfg. Co., of Milwaukee, has taken its first step into the motor truck field by turning out a new motor truck, in which the creeping traction device is embodied. The new vehicle is not intended for city use, of course, but for the use of farmers, road builders, contractors, lumbermen and others, who have to do heavy hauling over poor roads or no roads.

The vehicle consists of a standard motor truck chassis, whose front wheels are of the farm implement type, with ribbed steel tires, while the rear wheels are displaced by crawlers. These comprise nests of wheels and rollers inclosed in continuous flexible belts built up of links with sectional steel treads. On the inside is a track upon which the wheels run. A sprocket at the rear end drives the flexible belts or caterpillars. The gearbox affords four speeds forward, giving speeds of from 1½ to 10 miles per hour, and a draw-bar pull varying from 2,370 pounds to 9,000 pounds. The truck carries a body for five tons.

INCREASE OF 43 PER CENT. FOR SHELDON WORM

Reports from the Sheldon Axle & Spring Co., Wilkes-Barre, Pa., covering the fiscal year ending September, 1914, show an increase in the business of the worm gear axle department of 43 per cent. over the preceding year which in turn was 23.5 per cent. higher than the year 1912. From September, 1914, to date an increase of 42 per cent. over the corresponding period of 1914 has been shown.

In order to meet the increasing demands added space and equipment have been gradually added and during the past week two 92-inch grinders have been received as well as two additional oil fires in the drop forging department. Within the next 30 days a considerable run of floor space will be added to the worm gear department to take care of the enlarged line. Announcement also was made at the factory that the five-ton capacity worm gear axle will be ready for delivery early in June.

TWO LEADING MICHIGAN TANNERIES COMBINE

It is understood that the Ottawa Leather Co. and the Eagle Tanning Works, both with tanneries at Grand Haven, Mich., and offices in Chicago, will consolidate some time prior to July 1, with a capital stock of \$2,000,000. The new corporation will be known as the Eagle-Ottawa Company. William Hatton, general manager of the Ottawa Company for the past five years, will be president and general manager of the new concern whose office will be in Chicago.

These Michigan tanneries are famous for producing first class leather in large quantities. They are modern and up-to-date in every detail, and the new arrangement should tend to still further increase the mutual efficiency and success.

NATIONAL HAS NEW TWELVE CYLINDER

The National Motor Vehicle Co., Indianapolis, Ind., has a twelve-cylinder car as one of its new series models for the coming season. This new twelve will be manufactured entirely in the company's factory in Indianapolis. Shipments will begin in August. To date the motor has greatly exceeded the expectations of its designers in the matter of power generated and smoothness of running. It is much lighter, volume for volume than the six design and is as accessible as a four or six.

This new National will sell at \$1990 as a four or five-passenger car and can be had at slight additional expense as a six or seven-passenger job. It is made with 128-inch wheelbase and carries 36 x 4½-inch tires.

MEETING AND BANQUET OF ST. LOUIS ASSOCIATION

The May meeting of the St. Louis Implement, Vehicle and Hardware Association, was held at the Planters Hotel, May 17. Wm. Hirth, president of the Missouri Federation of Commercial Clubs and publisher of the Missouri Farmer, was a guest of the association and addressed the meeting on "The Business Outlook and Crop Conditions." Theodore Luth, Cincinnati, was also an invited guest and was called upon for an impromptu talk. Refined cabaret accompanied the banquet. The meeting was one of the most enjoyable of the season. Between 75 and 100 members and guests were present.

REORGANIZATION OF GRAVES PAINT CO.

The N. Z. Graves Co., paint manufacturer, with large plants in Camden, N. J., and Trainer, Pa., which has been in the hands of receivers for about two years, has been reorganized and financially rehabilitated under the name of the N. Z. Graves Corporation. The new company is chartered under the laws of Pennsylvania and has a capital stock of \$600,000. N. Z. Graves is president and Franklin D. Oliver is chairman of the board of directors. The offices of the company will be at 22-24 North Third street, Philadelphia.

BEAUTIFYING SHELDON PLANT SURROUNDINGS

A large force of men is busily engaged in beautifying the grounds surrounding the plant of the Sheldon Axle & Spring Co., at Wilkes-Barre, Pa. The work is being done for the company under the direction of the Superintendent of Parks and Grounds of the City of Wilkes-Barre, and will be laid out along the same lines that the commissioners have adopted in the public grounds and parks throughout the city.

RECEIVER FOR BUGGY COMPANY

The Hawkeye Buggy & Implement Co., 422 Court avenue, Des Moines, Ia., of which J. A. Hosmer is manager, was forced into involuntary bankruptcy June 3 when a petition was filed by three creditors asking that a receiver be appointed. The firm in its answer to the petition, admitted insolvency. G. E. Burns, of Des Moines, was appointed temporary receiver and has been placed under \$10,000 bond.

MOON'S MAY BUSINESS SHOWS 33.1 PER CENT. INCREASE

Reports from the Moon Motor Car Co., St. Louis, Mo., show that during April, 1915, the shipments and sales showed an increase of 24.7 per cent. over last year, and in May a gain of 33.1 per cent. over the same period last year.

C. H. A. T. NIGHT

The local entertainment committee for the C. B. N. A. convention to be held in Cleveland the week of September 20, has set aside Wednesday evening, the 22d, for the C. H. A. T.

NEW AUTOMOBILE CO. FOR JACKSON

It is rumored that a new automobile manufacturing concern is in the course of organization at Jackson, Mich., and that it will build a six-cylinder car at \$800.

The estimated number of automobiles owned in the United States in 1914 was 1,745,570. Assuming that these cars average not less than five tires each during the year, 8,727,850 tires were necessary for their equipment.

STANDARDIZED FARM WAGONS COMING

National Implement and Vehicle Association Committee Formulates Plans for Eliminating Superfluous Types

That the manufacturers of farm wagons are preparing to adopt standardization plans which have been worked out by a committee of the farm wagon department of the National Implement and Vehicle Association, and that the near future will bring simplified wagon construction, seems to be evident. A recent price list for 1916 gives four classifications of farm wagons, viz., light, medium, standard and heavy. The medium class is divided into "north" and "south." Options on tire sizes are given in each class, but each is given only one depth of bed, the depths ranging from 22 inches for light to 28 inches for heavy wagons. Size of skein is not mentioned.

The work of the committee mentioned is explained as follows: The purpose of the effort at standardization and sim-

plification of wagons is to produce an interchangeable line of wagon parts which will permit the dealer, the jobber and the manufacturer to serve the user quicker and better with all of his requirements, but with a smaller inventory of complete wagons and parts. It was thought advisable to confine the effort at this time to the standardization of two-horse wagons for farm, ranch and mountain use, without considering one-horse wagons, farm trucks and gears for special purposes. With this in mind, all gears with skeins larger than $3\frac{1}{4}$ in. and with steel axles larger than $2\frac{1}{4}$ in. have been counted as belonging to the special teaming gear class.

Types, Sizes and Capacities

It has been recognized that the size of skein is an improper standard by which to judge the capacity of a wagon for all territories and all classes of service. For this reason, wagons have been designated as, farm wagons suitable for heavy loads and rough mountainous country, and valley wagons suitable for an intermediate degree of service. The construction and

REGULAR FARM AND MOUNTAIN WAGONS									
Size	Type	Load	Axle	Skein		Wheel			
				Size	Type	Tire	Height	Hub	Spoke
Light	Farm	1500	$2\frac{1}{2}$ "	$2\frac{1}{2}$ x 8	Cast	$1\frac{1}{8}$ x $\frac{1}{2}$	40-44"	$2\frac{1}{2}$ "	2"
						$1\frac{1}{2}$ x $\frac{1}{2}$			
						2 x $\frac{1}{2}$			
						$2\frac{1}{2}$ x $\frac{3}{8}$			
Medium	Farm	3000	3"	$2\frac{7}{8}$ x $8\frac{3}{4}$	Cast	$3\frac{1}{2}$ x $\frac{1}{2}$	40-44"	3"	$2\frac{1}{4}$ "
						$1\frac{1}{2}$ x $\frac{5}{8}$			
						2 x $\frac{5}{8}$			
						$2\frac{1}{2}$ x $\frac{1}{2}$			
	Mtn.	4000			Steel	$1\frac{1}{2}$ x $\frac{5}{8}$	44-50"		$2\frac{1}{4}$ "
						2 x $\frac{5}{8}$			
						$2\frac{1}{2}$ x $\frac{1}{2}$			
						$3\frac{1}{2}$ x $\frac{1}{2}$			
	Farm	4500	$3\frac{1}{4}$ "	$3\frac{1}{4}$ x 10	Cast	$1\frac{1}{2}$ x $\frac{5}{8}$	40-44"	$3\frac{1}{4}$ "	$2\frac{3}{8}$ "
						$1\frac{3}{4}$ x $\frac{1}{2}$			
						2 x $\frac{5}{8}$			
						$2\frac{1}{2}$ x $\frac{1}{2}$			
Standard	Mtn.	5500	$3\frac{1}{2}$ "	$3\frac{1}{2}$ x 11	Steel	$1\frac{1}{2}$ x $\frac{5}{8}$	44-50"		$2\frac{1}{4}$ "
						$1\frac{3}{4}$ x $\frac{1}{2}$			
						2 x $\frac{5}{8}$			
						$2\frac{1}{2}$ x $\frac{1}{2}$			
	Farm	6000	$3\frac{1}{2}$ "	$3\frac{1}{2}$ x 11	Cast	$1\frac{1}{2}$ x $\frac{5}{8}$	40-44"	$3\frac{1}{2}$ "	$2\frac{5}{8}$ "
						$1\frac{3}{4}$ x $\frac{1}{2}$			
						2 x $\frac{5}{8}$			
						$2\frac{1}{2}$ x $\frac{1}{2}$			
Heavy	Mtn.	7000	$3\frac{3}{4}$ "	$3\frac{3}{4}$ x 12	Steel	$1\frac{1}{2}$ x $\frac{5}{8}$	44-50"	$3\frac{3}{4}$ "	3"
						$1\frac{3}{4}$ x $\frac{1}{2}$			
						2 x $\frac{5}{8}$			
						$2\frac{1}{2}$ x $\frac{1}{2}$			
	Farm		$3\frac{3}{4}$ "	$3\frac{3}{4}$ x 12	Cast	$1\frac{1}{2}$ x $\frac{5}{8}$	40-44"	$3\frac{3}{4}$ "	$2\frac{5}{8}$ "
						$1\frac{3}{4}$ x $\frac{1}{2}$			
						2 x $\frac{5}{8}$			
						$2\frac{1}{2}$ x $\frac{1}{2}$			
	Mtn.		$3\frac{3}{4}$ "	$3\frac{3}{4}$ x 12	Steel	$1\frac{1}{2}$ x $\frac{5}{8}$	44-50"	$3\frac{3}{4}$ "	3"
						$1\frac{3}{4}$ x $\frac{1}{2}$			
						2 x $\frac{5}{8}$			
						$2\frac{1}{2}$ x $\frac{1}{2}$			

For 4" tire on Medium South take wheels from Medium North.
For 2" tire on Heavy Farm take wheels from Standard Mountain.

VALLEY WAGONS

Size	Type	Load	Axle	Skein		Wheels			
				Size	Type	Tire	Height	Hub	Spoke
Medium	Valley	3500	3"	$2\frac{7}{8}$ x $8\frac{3}{4}$	Steel	$1\frac{1}{2}$ x $\frac{5}{8}$	40-44"	3"	$2\frac{1}{4}$ "
						$1\frac{3}{4}$ x $\frac{1}{2}$			
						3 x $\frac{1}{2}$			
						$4\frac{1}{2}$ x $\frac{1}{2}$			
Standard	Valley	5000	$3\frac{1}{4}$ "	$3\frac{1}{4}$ x 10	Steel	$1\frac{1}{2}$ x $\frac{5}{8}$	44-50"	$3\frac{1}{4}$ "	$2\frac{3}{8}$ "
						$1\frac{3}{4}$ x $\frac{1}{2}$			
						3 x $\frac{5}{8}$			
						$4\frac{1}{2}$ x $\frac{1}{2}$			
Heavy	Valley	6500	$3\frac{1}{2}$ "	$3\frac{1}{2}$ x 11	Steel	$1\frac{1}{2}$ x $\frac{5}{8}$	44-50"	$3\frac{1}{2}$ "	$2\frac{5}{8}$ "
						$1\frac{3}{4}$ x $\frac{1}{2}$			
						3 x $\frac{5}{8}$			
						$4\frac{1}{2}$ x $\frac{1}{2}$			

EXTRA LOW FARM WAGONS

Size	Type	Load	Axle	Skein		Wheel			
				Size	Type	Tire	Height	Hub	Spoke
Medium	Ex. Low Farm	3000	3"	$2\frac{7}{8}$ x $8\frac{3}{4}$	Cast	$1\frac{1}{2}$ x $\frac{5}{8}$	36-40"	3"	$2\frac{1}{4}$ "
						2 x $\frac{5}{8}$			
						$3\frac{1}{2}$ x $\frac{1}{2}$			
						$4\frac{1}{2}$ x $\frac{1}{2}$			
Standard	Ex. Low Farm	4500	$3\frac{1}{4}$ "	$3\frac{1}{4}$ x 10	Cast	$1\frac{1}{2}$ x $\frac{5}{8}$	36-40"	$3\frac{1}{4}$ "	$2\frac{3}{8}$ "
						2 x $\frac{5}{8}$			
						$3\frac{1}{2}$ x $\frac{1}{2}$			
						$4\frac{1}{2}$ x $\frac{1}{2}$			

STEEL AXLE WAGONS

Size	Type	Load	Axle	Skein		Wheel			
				Size	Type	Tire	Height	Hub	Spoke
Light	Farm	2000	$1\frac{1}{8}$ "						
Medium	California	3500	$1\frac{1}{8}$ "						
Standard	Farm	5000	$1\frac{1}{4}$ "						
Heavy	California	6500	2"						

Note:—1. Farm takes corresponding Farm or Valley Wheels.
2. California takes corresponding Mountain Wheels.

Fig. 1—Chart for Wagon Standardization

carrying capacity of each type has been designated according to the service required, and gears should, therefore, be stenciled for size and capacity as per the following example:

Light, capacity 1,500 pounds; heavy, capacity 6,000 pounds.

The effect of such designations should be the sale, in each case, of wagons which are constructed to do a definite piece of work.

Gears

It was felt that the $2\frac{3}{4}$ wagon is properly a one-horse wagon and has no place in the two-horse group. This involves no hardship for the user, as he can make a two-horse wagon out of it by using a cross bar pole.

The $2\frac{3}{4}$ wagon used largely in the south has, by common practice, become practically a 3-inch wagon. Therefore, it was thought wise to merge these two sizes, using the axle, hub and reach of the regular 3-inch wagon, with a compromise skein which should not exceed 3 inches at the shoulder, but fitting this gear with wheels such that the medium farm wagon south, with a $2\frac{1}{2}$ spoke, would easily take the place of the former $2\frac{3}{4}$ wagon, and the medium farm wagon north, with $2\frac{1}{4}$ spoke, would take the place of the former 3-inch wagon. But the opportunity for universal simplification and benefit

Square End		Boot End		Rack Bed			Cotton Bed				Triple Tops	
Length	Depth	Length	Depth	Length	Depth		Length	Rail	Top	2nd Top	Length	Depth
9' 6"	16" 18"	9' 6"	16"									
10'	20" 22" 24"			10' 6"	5½"	10 or 11	12'	8"	To not exceed 24"		9' 11"	
10' 6"	22" 24" 26" 28"	10' 6"	26" 28"	13' 6"	8"	13 or 14					10' 6"	13"
12'	22" 24"	11' 6"	22" 24"	15' 6"	8"	14 or 15					12'	11"

Length given on square end boxes is over all.

Length given on boot end boxes covers over all for square part of box.

Length of boot end section to be 12 inches over all.

Fig. 2—Chart for Wagon Boxes

lies in the adoption of a single gear for each capacity rather than a large variety of gears. Some of the practices of the past which have made this impossible have been as follows:

(a) Wheel heights for high, low and extra low wagons which could not be reconciled with a single gear.

(b) Furnishing both round and square hounds on the same type of wagon.

(c) Furnishing both ordinary and extra heavy rectangular reaches and round reaches on the same type of wagon.

(d) Furnishing a great variety of heights of bolster stakes.

(e) Furnishing a variety of colors of painting.

(f) Furnishing both wide and narrow track.

(g) Furnishing bolsters for both wide and narrow beds.

The problem of simplifying the multiplication of gears resulting from the above has been solved, as follows:

(a) Use 36, 40, 44 and 50-inch wheels as per chart. This permits a single gear to be equipped with 44-50 wheels and make a high-wheeled wagon which meets a compromise popular demand. The same gear will take 40-44 wheels for a low-wheeled wagon, and 36-40 wheels for an extra low wagon.

(b) While every factory is at liberty to use either round or square front hounds, the convenience of all concerned will be promoted if each factory decides which kind it will build and refrains from building both on the same type of drop tongue gear.

(c) The need for an ordinary strength and extra strength reach was recognized, and either the round type or rectangular type is permissible. But simplicity of gears will be promoted if each factory will confine its extra strength reaches to one type, either round or rectangular.

(d) An unnecessary multiplication of gears due to stake heights can be avoided by adopting 8 in. and 13 in. over all as heights for stakes. It is further suggested that each manufacturer develop a detachable extension stake which can be used in conjunction with the 8-in. base stake and thereby arrive at any height desired, using only one gear for each size.

(e) Wagon complications can be simplified if each manufacturer will paint his wagon boxes one color, and paint his gears one color.

(f) The use of both wide and narrow track gears was recognized, but it was admitted that the automobile practice is fast tending toward the adoption of a single track. It was thought wise to meet this coming change by adhering to 4½ ft. for narrow track and 5 ft. for wider track, measuring from center to center of tire on the ground, and to encourage the national adoption of a standard track at every opportunity.

(g) Bolster widths on narrow track wagons should be 38 in., on wide track wagons 38 in. or 42 in., but an effort should be made to encourage the use of the 38-in. bolster on wide track wagons, not only because it simplifies the gear and box problem, but because it results in a short turn, wide track wagon.

Wheels, Axles and Skeins

As the charts herewith show (see Fig. 1), the cast skein is found only in the farm type wagon, and the steel skein is found on the valley and mountain types. The axle and hub sizes should continue as formerly made by each manufacturer for each size of wagon made by him. The standard spoke sizes for all wheels are indicated on the chart and require no explanation. The mountain and valley wheels make take tire rivets at the option of the manufacturer, but farm wheels should be without tire rivets.

Mountain or valley wheels can be used on farm and vice versa. A careful study of the chart will disclose a surprising interchangeability of wheels. Bois D'Arc construction should be confined to felloes which should take regular painting with a yellow or some other distinguishing stripe, but Bois D'Arc felloes should be furnished only on 44-50 wheels with $1\frac{1}{2} \times \frac{5}{8}$ square edged tires, until the oval edge tire is universally adopted.

All wheels may be made with either bent rims or sawed felloes. All 40-in. wheels should be made with twelve spokes each so as to make them available for use either in front or on the rear. If a like construction of the 44-in. wheel were adopted, the total number of finished wheels would be materially reduced.

Tires

The standardization tire assortment, as shown on the charts and set opposite the types and sizes of wheels for types and sizes of wagons shown therein, is proposed as the most fruitful source of simplicity, unless it be the single gear. With this tire assortment coupled with uniform wheel heights and the single gear, the dealer with a small and carefully selected stock of wheels can fill a large variety of orders without increasing his investment.

The oval edge tire is recommended for universal adoption, and where used at all the square edge tire should be furnished only on the 44-50 wheels having $1\frac{1}{2} \times \frac{5}{8}$ tire. All tires wider than 4 in. are ignored by this plan as coming under the head of special construction at the option of the builder. Tires may be held in place with either bolts or spikes, but both should not be used.

Tongues and Seats

Tongues should be either drop or stiff, or half stiff, with chains or neckyoke.

Because of the constant breaking of lazy back, seats should

be confined to one medium high-back type without lazy back, while farm seats should have only two leaf springs. Mountain seats, because of the exacting service, should have either two or three leaf springs.

Boxes

The depth of component parts of a double or triple box should be discouraged, and all reference to the depth of boxes should be in total inches. For example—a 26-in. box should be designated as such, and should not be called a 14 and 12 13 and 13, or any other specific combination.

The types, lengths and total depths of boxes should conform to the schedule, as shown in Fig. 2.

Standard box widths to be 38 in. and 42 in. Until narrow and wide tracks of 54 in. and 60 in. shall be standardized, the use of the narrow box on the wide track wagon should be encouraged in every possible manner.

Steel Axle Wagons

With the exception of the axle and cap, the steel axle farm wagon should be identical with the regular farm. The size of steel axles, which correspond to the sizes of wooden axles, should be as per the standard chart. When equipped with regular mountain or valley wheels, this wagon may be sold as a steel axle valley or California wagon.

Detachable Assemblies

In order to preserve the essential advantages of the single gear idea, the use of detachable special assemblies is urged. For example—instead of making extra gears for the block tongue and chaser reach requirements, or for trade requiring the same height of wheels all around—use false bolsters and detachable reach assemblies which can be applied in factory shipping room or by the dealer upon a regular gear.

Adoption of Recommendations

It was the sense of the wagon department of the N. I. V. A. that the standardized wagon recommendations merited the approval of the division and could be adopted with profit by all manufacturers, jobbers, dealers and users of wagons.

Manufacturers are urged to convince themselves of the simplicity of the plan herewith proposed by making an experiment in their own factories. For this purpose the committee suggests the following, which partially illustrates one of the most radical changes proposed:

Use a 3-in. gear with or without the $2\frac{7}{8}$ -in. skein, which will level up the bed when fitted with 44-in. and 50-in. wheels.

With one pair each of 36, 40, 44 and 50-in. wheels with $2\frac{1}{2}$ spoke, you can make:

- (1) Medium Farm North High
- (2) Medium Farm North Low
- (3) Medium Farm Extra Low

By adding one pair each of 40, 44 and 50-in. wheels with $2\frac{1}{2}$ spoke you can also make:

- (4) Medium Farm South High
- (5) Medium Farm South Low

Thus one gear and seven sizes of wheels make five different wagons. Present practice requires four gears and ten sizes of wheels.

In order to produce early results it is urged that all manufacturers put each item into operation as early as their factory plans will permit—having January 1, 1916, in mind as the final date on which all should be able to adopt the entire plan.

THE JITNEY

From San Francisco to Boston the "Jitney" has made its way and the "Flivver" car has invaded every principal city from Maine to California. Traction people in the larger cities are estimating their losses at a million or more dollars a year, but "still they come," the Jits, the Jits, and traction stocks are having fits. While Jitney owners organize, the Jitneys increase like swarms of flies, and no one needs a private car, so many Flivver cars there are. A limousine's the only thing a private

owner drives this spring, for every car looks like a Jit to every ordinary cit. unless it's lined with velvet plush, encased in glass and filled with lush (poetic license) ious looking girls with curls which prove it ain't no Jitney bus, that's driven by some onery cuss, who never drove a car before and never will again, what's more, when he has had one real good smash and made his patron's into hash. Alas, the proud aristocrat, who bought a car (a hundred flat and ten a week), no longer seems to own the town, to scorn you with a withering frown, for now indeed he hasn't look to right or left—he fears the hook, the cry, "a Jit" rings in his ears, and hours and days are filled with fears, that when his Flivver car appears upon the street some one will say another Jitney's out today. Gone is the pride of him who owns a car that cost five hundred bones. Gone is the day of motor pride for none there are too poor to ride. Gone is the automobile fever, for any soft or hard coal heaver can buy a Jitney ride today, as well as one whose weekly pay was most enough to buy a car, which led to ruin and "gates ajar." Soon, soon the cry will be a horse! my kingdom for a real live horse! The days of pleasure cars are o'er, the Jitney's bringing back the horse. The auto owner counts his loss, then rushes out to buy a nag, for fear he'll get a Jitney jag, account of being hailed each day by friends and foes who get his goat just like the man who rocks the boat, and tain't no use to cuss and swear if some one offers you a fare, for if you drive a little car, why, what's the use, it's no abuse. you're judged by company you keep, and Jitney's sure have come to stay, the pleasure car's gone up the river, 'twas stranded by a little Flivver, so buy a horse and be a man; it's hard, we know, but if you can, 'twill save your pride a bloomin' bit—you won't be taken for a Jit.—Horse Lover.

PHILADELPHIA ASSOCIATION HOLDS LAST MEETING

The Carriage and Wagon Builders' Association of Philadelphia, Pa., held its regular monthly meeting at the Hanover Hotel, on Friday, May 21. The association will not meet again until the third Friday in September.

The subject for the evening was "Substitutes for Wood in Vehicle Body Building," and the different members gave their views regarding some of the newer materials which are coming into use in the construction of carriage and automobile bodies, including plastic and semi-plastic materials. The sum of \$98.25 was appropriated for the current expenses of the Carriage Builders' Technical School which is conducted in the Y. M. C. A. Central Branch, Philadelphia, under the patronage of the association.

On motion it was also resolved to support the school for another year, and a sufficient sum was pledged to meet any deficiency that might not be covered by the regular tuition fees. The Philadelphia carriage builders are well pleased with the way the school has been conducted, and with the progress the young men in the class have been making during the past year.

A large number of drawings, made by the students, were exhibited at the meeting, and as they were passed from hand to hand, the manufacturers present commented upon the wonderful progress that showed complete working drafts of vehicles and parts, as well as joints, panels, bevells, inclinations, etc., most of them made by young men who could scarcely draw a straight line when they began to take the course.

While the school has been successful in every way, it is anticipated that the attendance will be much larger next term, when, in addition to the lessons already available, a complete course in automobile body building will be ready. A number of young men, not now in the class, had signified their intention of taking the course as soon as the automobile lessons were ready for them.

William Bauer, 2342 Dickinson street, Philadelphia, won the Y. M. C. A. Scholarship prize.

A. P. Cardwell informed the members of the association that an exhibit was to be made, May 25 and 26, at the Waldorf-

Astoria, New York, in connection with the manual training exposition of the National Association of Manufacturers. In addition to a large number of charts and drawings, a quantity of wooden blocks, shaped to show all the joints, miters, bevels, inclinations and curves used in body building, made by the students from their own working drafts, were included in the exhibit. As the material was sent to New York at the special request of the National Association of Manufacturers, the Philadelphia carriage builders were naturally gratified to learn of this recognition of their school.

At the conclusion of the meeting the members adjourned to the dining room of the Hotel Hanover, where the usual fine banquet was served. Although the Philadelphia carriage builders will not have another regular meeting of their association until September, it is probable that the usual excursion to the seashore will be held some time during the summer, so the members will have an opportunity to come together at that time.

THE REPORT ON FARM MACHINERY TRADE ORGANIZATIONS

The comments of the Commissioner on the doings of all organizations in these lines, extending over a period of more than 30 years, seems to have caused the public press to mention our organization and that of the retail dealers in such a way as to suggest that this report had only reference to these associations.

Our executive board met here recently in regular session and considered among other things this matter, reviewing the implications contained in the report, but did not find an instance where our organization could be justly charged with anything wrong or in violation of law.

In order, however, that justice may be done and the government better informed as to our work and actions, a committee of five was appointed and given full power to act for the association in dealing with this matter. This committee has not yet fully completed its plans, but it is not unlikely that this matter will be brought before the Federal Trade Commission with a request for further investigation.

We would recommend that those interested in this subject procure a copy of the complete report, which can be obtained of the Superintendent of Documents, Government Printing Office, Washington, D. C. issued March 15, 1915, entitled: "Farm Machinery Trade Associations," which will be found interesting and instructive.

It will be well to bear in mind in considering this report that it deals with a number of organizations which have from time to time existed in farm operating equipment lines, some of which have passed out many years ago, so that their acts as recorded have no possible connection with the operations of either the manufacturers' or dealers' associations of today, making it difficult to determine whether or not the concluding paragraph of the Commissioner of Corporations' letter of transmittal refers to the present associations, reflecting as it does on some actions, or to those which existed some time ago.

Our association certainly hopes that the public may be made acquainted with its efforts to bring about an improvement in conditions in these lines, not only through economies in manufacture resulting from efforts in standardization, simplifications, etc., but to aid the retailers of these lines in acquiring a better general knowledge of business in many practical ways to the end that the consumer may be better served at a minimum of expense.

The competition in these lines, not only as to manufacturing but retailing is perhaps more intense than in most lines of merchandise, and if it is wrong that we should work together in eliminating waste and making this competition more intelligent to the end that a fair return may be had by the manufacturer for the employment of his capital and labor, and to provide the retailer with a fair margin to cover his investment and efforts, the newly created commission can render the coun-

try no better service than to undertake the consideration of this matter without delay. Yours truly,

E. W. McCULLOUGH,

Secretary and General Manager, National Implement and Vehicle Association.

HORSE PRICES FOR THE PAST YEAR

The Union Stock Yard and Transit Co., of Chicago, have given out the following figures, which show the average prices realized for horses in five principal classes handled by the concern in 1914. Average prices are also given for seven years previous to 1914:

	Draft Horses	Carriage (Pairs)	Drivers	General Use	Saddlers
1914					
January	\$205.00	\$450.00	\$170.00	\$155.00	\$185.00
February	220.00	500.00	175.00	160.00	195.00
March	225.00	520.00	180.00	165.00	200.00
April	225.00	520.00	180.00	165.00	200.00
May	220.00	520.00	175.00	160.00	195.00
June	215.00	520.00	170.00	155.00	190.00
July	205.00	490.00	170.00	150.00	185.00
August	200.00	480.00	165.00	145.00	180.00
September	195.00	465.00	160.00	150.00	175.00
October	195.00	450.00	160.00	150.00	170.00
November	200.00	450.00	160.00	145.00	170.00
December	195.00	450.00	160.00	145.00	170.00
Av. 1914	\$208.00	\$483.00	\$169.00	\$160.00	\$184.00
Av. 1913	213.00	493.00	174.00	165.00	189.00
Av. 1912	210.00	473.00	177.00	160.00	195.00
Av. 1911	205.00	483.00	182.00	155.00	190.00
Av. 1910	200.00	473.00	172.00	144.00	177.00
Av. 1909	194.00	482.00	165.00	137.00	172.00
Av. 1908	180.00	450.00	156.00	129.00	164.00
Av. 1907	194.00	482.00	165.00	137.00	172.00

INTERNATIONAL TIRE STANDARDS AND THE S. A. E.

At the meeting of April 20-22, at Detroit, of the Society of Automobile Engineers, the International Standards Division of the society placed particular emphasis on the necessity for educational literature to present to the attention of foreign interests the advantages of international solid tire standards, and it was agreed that the Institution of Automobile Engineers and the Society of Motor Manufacturers and Traders of England should be consulted in this connection and their assistance obtained.

This division of the S. A. E. is composed of members resident in this country and abroad, and its object is the obviously beneficial one of harmonizing dimensions of American and European solid and pneumatic tires and making such tires interchangeable throughout the world. The solid tire situation has been selected for first attention. Standardization of the mounting of solid tires on motor trucks has already been effected, and the society has recommended concentration upon three diameters of tire only—32, 36 and 40-inch—as a means of reducing tire cost and to bring about the carrying of tires in stock at all necessary places. The majority of the American truck manufacturers are now using tires of these three diameters exclusively, in 3½, 4, 5 and 6-inch widths.

IMPLEMENT AND VEHICLE MIXTURE

It is reported that some of the vehicle manufacturers have prepared, or are about to prepare, a petition to the Interstate Commerce Commission asking for abrogation of the rule which permits mixing of implements and vehicles in carload lots. The object of the petition is unknown.

In connection with the story as told it is also said that the proposed change will be opposed by the dealers' associations on the ground that the cancelation of this mixing privilege would be detrimental to the interests of dealers who buy vehicles in less than carload lots and have them shipped from distributing centers in carloads with implements.—Farm Implement News.

HOW TO CARE FOR VEHICLES

By L. Burg, President L. Burg Carriage Company

Every owner and user of pleasure vehicles ought to inform himself how properly to take care of them. Vehicles are made for use and not abuse; if abused or misused the user must and should expect to stand the consequences. It is immaterial how well a vehicle is made or how good the material is which enters into the construction of the vehicle, by improper care or no care at all, it can in part, or in whole, be ruined and made unfit for use. The following instructions should be observed to get the best results:

Bodies and Seats

Bodies are made of thoroughly dry timber and will expand when subjected to moisture internally. Water will dissolve glue and cause the disintegration of the body and seat. Protect the internal part of the body and seat from moisture.

Wheels and Tires

Four main causes may loosen the tires on thoroughly seasoned and dry wheels:

1. Subjecting the wheels after the paint is worn, or knocked off the felloes, to moisture or mud, etc. This expands the felloes and forces them into the ends of the spokes.
2. By violently pounding the wheels, while vehicle is used over railroad tracks, bridges, rough roads, etc. This violent pounding causes the contraction of the felloes.
3. By forcing the felloes into the ends of the spokes by overloading the vehicle.
4. The expansion of the tires in hot weather, and the drying out of the moisture in dry weather which entered into the felloes when they were not properly protected by paint and varnish.

The manufacturer cannot be held responsible for above enumerated causes.

Repaint the felloes when the paint is off. Keep the vehicle in a dry place when not in use. Drive carefully over bridges, railroad crossings and rough or bad roads. Do not overload the vehicle.

The wheels are dished to brace them. Loose tires often take the dish out of the wheels. Tires must be kept tight and wheels must have proper amount of dish, otherwise the wheels will not do the work required of them. In re-tiring the wheels great care must be exercised by not dishing the wheels too much.

Axles

Pleasure vehicles equipped with 15/16 or 1-inch fantail steel axles are designed to have a carrying capacity of two persons of ordinary weight; 1 1/16-inch, four persons of ordinary weight; 1 3/8-inch, five to six persons of ordinary weight, and 1 3/4-inch, six to nine passengers. Overloading a vehicle beyond its capacity, or careless driving may cause the springing or bending of the axles, and, perhaps, also their breaking. The axle spindles must at all times be properly washered, otherwise the boxes may stick to the axle spindles and loosen the boxes in the hubs. The use of improper oils or greases on the axle spindles usually makes them become dry and hard, causing the vehicle to run heavy and often also causes the boxings to stick to the axle spindles thereby causing their ruination. No application of oils produces the same effects. Remove all foreign matter and worn out oils from the axle spindles and boxings. Use proper oils. Axle spindles must at all time be properly washered.

Springs

Springs are generally broken or bent by upsetting or overloading the vehicle or by driving recklessly over rough roads, all of which can be prevented by proper and careful driving.

Dashes and Fenders

The material used in covering dashes and fenders has a heavy

coating of enamel, and this material when cold or frozen will crack if bent. Do not handle roughly the enameled covered dashes when cold or frozen.

Gear—Fifth Wheel

Do not apply any oils or greases to the wearing parts of fifth wheel. If oiled or greased it will accumulate dust, sand or mud, accelerating wear. Keep all the nuts tight on the gear and body.

Upholstering and Top

Subjecting trimming leather, cloths, etc., to excessive moisture and other exposures damages it and causes its deterioration and destruction. Live stock and vermin such as moths, rats, mice, etc., often damage upholstery. The internal parts of a vehicle must be kept dry and free from all exposures. To prevent or destroy moths in woolen fabrics use camphor and turpentine.

The leather used on a top, for leather quarters and stays, is enameled to prevent water percolating through the leather. Enameled leather, when folded or crushed, especially in cold weather, will form creases and cracks. By reckless folding or crushing a top the original form or shape is destroyed and the lining is subjected to wear and tear. If tops remain crushed they are liable to be damaged by rats and mice building nests therein and by all kinds of vermin. Poultry should not be permitted to roost near or on top of a vehicle. Their droppings damage the top covering and other parts of the vehicle. Do not lay down, fold, or crush a top. Dry side curtains and storm apron before folding. Store vehicle in a clean, dry place.

Shafts and Poles

High grade shafts and poles are more liable to warp than low grade, because high grade timber, derived from young, tough, thrifty hickory, is used for high grade shafts and poles, and low grade timber derived from old, doty, lifeless, large trees is used in making low grade shafts and poles. High grade shafts and poles are pliable. Poor grade ones are stiff and cannot easily be bent. Shafts and poles must be stored in such a manner as will prevent their warping. Exposing shafts and poles to sun and rain may cause them to warp. Resting them on their ends may cause their center to bow down. Keep shafts and poles in a dry, clean place when not in use, and store them in such a manner which will not cause their warping.

Painting

Keep the carriage in a dry place, and away from the drainage of the stable. If your carriage house is near the manure heap, ammonia will surely cause the varnish and paint to perish.

Dust, when allowed to settle on a carriage, eats into the varnish, hence the carriage room should be as free from dust as possible. If this is carefully observed there is no need to cover the carriage, but if it stands unused for several days where it is exposed to dust, it should be protected by a large cover sufficiently strong to keep off the dust without excluding the light. Close cotton sheeting is the best material. Care should be taken to keep the cover dry.

Should the paint get knocked from your carriage or rubbed from the body or wheels, have it painted with oil lead and finished before water is put on the job. Never let mud or water dry on a new carriage; it will kill the lustre of the varnish.

If dry sand or mud adheres to the spokes, hubs or felloes, soak them with water thoroughly before removing it; otherwise you will scratch the varnish badly. If your carriage has been used in a rain storm, and mud is frozen on the carriage, do not use hot water to get it off it will spoil the painting. Hot water or soap should never be used to wash a varnished surface.

When being washed, the carriage should be placed out of the sun to avoid the risk of blistering.

After washing a carriage, wipe it dry with a damp chamois skin. A drop of clean water drying on varnish will spot it.

U. S. NOT PLAYING THE HYPOCRITE IN SELLING WAR MATERIAL

Probably all the manufacturers who are making shipments of war material would rather have business of other kinds. It isn't exactly comfortable to feel that one is making shrapnel to kill thousands of men, but we believe that all the criticism that is being indulged in is unjustified.

No one who has objected to the sale of war materials to the allies has succeeded in showing that the position taken by the Department of State of the United States government is not thoroughly in accord with well-established principles of international law, which permit a belligerent to procure munitions of war, with the exception of war vessels, from any neutral country and that a neutral country is not under the slightest obligation to prevent the export of such articles to any belligerent. The protest of the German government, in its note received at Washington recently, against the shipment of munitions is not well founded and the effort to establish a parallel between the present policy of the President and his action in preventing shipment of arms to Mexico cannot succeed, for in the case of the troubled republic, conditions were very different and upon the President Congress conferred special power which he does not possess in regard to the European war.

That the well-established law of nations rests upon a solid foundation and is in harmony with the welfare and progress of the nations is clear.

If neutrals were not permitted to sell to belligerents, every nation would be compelled to depend on its own resources and could not buy any kind of material that could possibly be used in warfare. Such a policy would be in the highest degree unjust to peaceful powers, for it would give a great advantage to nations seeking war and would tend to compel peaceful nations to expend more than the world has ever witnessed in preparing for possible attack. A country remaining neutral and unprepared would be in a helpless condition. Suspension of sales to belligerents would, as recently pointed out by Prof. Gregory, dean of the department of law in the George Washington University, impose a policy of most strenuous militarism on all nations. "No nation could afford," says Prof. Gregory, "to be without complete supplies, adequate for war, always available within her borders. To be short in any essential might cripple her armies, lose her cause and ruin her government and her people. Her riches would be a bait, not a resource of defense."

Ex-President Taft has also pointed out that if the United States adopt the principle that neutral nations cannot rightly sell munitions to belligerents, and if other countries were to follow suit, the question would arise, in what position would the United States be left, supposing that hereafter it should suddenly be involved in a war with a well-prepared foreign state?

While to the superficial and sentimental observer the policy of manufacturers may not seem to be in harmony with strict neutrality, it is, in fact, the only policy consistent with real neutrality.—Iron Trade Review, Cleveland.

HORSE DIGS OWN GRAVE

This is the story of a horse who dug his own grave. His name is—or rather was—Jack. He lived during the declining days of his life on the farm of Anton Kriesler in Walker township, four miles from Grand Rapids.

Jack was the property of Lambert Mohler. Some time ago Mohler vacated the farm in favor of Kriesler. Jack had been faithful for the 20 years of his life. Mohler is kind to his animals.

So he asked that Jack be allowed to remain at the old home and wander about over the pastures which had been his habit for so many years.

But every horse has his day, just as truly as the dog. Yesterday Jack realized that the end was near. He went to the

middle of the pasture where for years he had eaten the rich, green grass, and began to dig his grave. Jack scooped away the sod.

Then with all of the remaining strength which he had in his old, shambling body, he pawed away the dirt and stones until he had a hole which would contain his body. Then, just as solemnly he lay down to await the end. Kriesler found Jack soon afterward. He notified Deputy Sheriff Pohl. The officer came and with him he brought a revolver. The sufferings of Jack were over.

He had dug his own grave.—E. M. Radcliffe, Grand Rapids, Mich.

CINCINNATI CARRIAGE MAKERS' MEETING

Fifty-two members of the Cincinnati Carriage Makers' Club were present at the May meeting, which was held at "Heidelberg," in Newport, Ky., May 13. The members enjoyed one of the spring chicken dinners that have made Heidelberg so well known throughout this section.

The members were called to order at 7 o'clock by President Clem Perrine, and with the strains of Prof. Hofer's orchestra, those present were entertained in true country style. The lawns were decorated with the national colors and everybody was in good spirits.

The speaker of the evening was Dr. Millard Wallenstein, and his subject, "Medicine; Its Relations to Business," was one of the best talks that the members have enjoyed for some time. He explained the relation of one's physical condition to success in business.

The annual June outing was discussed and the entertainment committee reported that they had chartered the steamer "Kentucky" for the outing, to be given on Saturday, June 19. An up-river trip will be made, stopping at New Richmond for dinner and the usual athletic sports.

The Cincinnati Carriage Makers' Club is booming under the guidance of President Perrine, and the following new members were elected at this meeting: Thomas M. Geoghegan, associate district manager of The Aetna Accident and Liability Co., presented by C. J. Rennekamp; Ralph Pohek, representing The Murphy Varnish Co., Chicago, presented by P. P. Hunter and H. H. Nelson; Louis J. Hodge, representing The Excelsior Supply Co., of Cincinnati, presented by P. P. Hunter and H. H. Nelson; Ed. J. Knapp, of The Hickory Carriage Co., of Cincinnati, presented by Clem Perrine; W. J. R. Alexander, representing The Wright Varnish Co., Cleveland, O., presented by Ed. J. Knapp; H. H. Baldwin, representing The Standard Varnish Co., presented by Milt Wieman and R. E. Rowalt.

The following transfers of membership were approved: C. I. Bennett to Milt Wieman, of The Brown Carriage Co.; W. H. Barcus to H. W. Ferkler, of The Carriage Monthly; H. Crumley to John Creighton, of The Ditzler Color Co., Detroit.

The club expects to enroll from six to ten new members at the June outing, and the present term should eclipse anything in the way of like undertakings for many years.

The carriage industry in Cincinnati should be congratulated for a showing of this kind, which goes to show that "Old Dobbin" is still in the harness and expects to be for all time.

WAGON COMPANY "GOING SOME"

Speaking of the Kentucky Wagon Mfg. Co., the turning of the tide for that concern has perhaps been the most notable individual industrial happening of the past few months. In eight weeks the stock of that concern has risen 20 points. It is now selling at 55 on the local exchange. Under the administration of President R. V. Board, who came to Louisville from the International Harvester Co., the wagon company has been alert to extend its activities in numerous directions. Perhaps the most notable feature of all is that its advance began and has continued in a period of widespread industrial depression.—Louisville Times.

THE VITAL QUESTION—WHAT IS YOUR COST OF DOING BUSINESS?

That is the almighty question: What is "your" cost of doing business? And another question: Do you know, are you guessing at it, or don't you care? From investigations, I find two of these questions is answered in the affirmative and the latter in the negative. Some firms know practically to a cent what it costs them to do business. Others know approximately and guess at the rest. Others guess entirely, and others don't care. The last answer accounts for so many business failures in all lines.

The mercantile reports for January, 1915, give the total number of failures in all lines at 2,848. Had many of these concerns known what it cost them to do business, there would not have been the need of one-half of these failures. Of course, sometimes circumstances over which we have no control will swamp our "Boat of Business" in spite of very skillful handling.

Necessary Knowledge

It is just as necessary for the business man to know his chart—"the cost of doing business"—in order to sail his "business craft" safely, as it is for the sailor to know the charts of the seas; to know where the reefs are and know where the safe channels are, so that he can sail his boat intelligently.

Many are now on the high seas of business activity without absolutely any knowledge as to where they are. As a matter of fact, they don't know whether they are "going or coming." That is the reason why 5,000 of them found that they were "coming" back to meet the sheriff.

With a complete accounting system business and knowing where you are, when a "squall" hits you, you can take a "few reefs in your sail" and lower the pressure. That may mean, not to buy quite so much goods or it may mean to let out an extra man, or it may mean to cut off some improvement contemplated, or some other item that could be gotten along without, until the "squall" was over and then when you had clear sailing, a good breeze, and had studied your "business chart" and knew where the money was coming from. Then go ahead with this expense or improvement.

A business man does not necessarily have to be insolvent to go broke or into the bankruptcy courts. I know of a real estate firm which was very hard pressed for cash to meet its obligations, and yet it had over \$60,000 worth of gilt-edge paper in the safe, which could not be sold or from which a dollar could not be realized. It is just such circumstances as these that get the business man occasionally.

Financially, I was worth more money in 1913 than any other year in the history of my business, and yet I was more in need of ready cash than in any other year in the history of my business, and it took finer management to sail my business craft than ever before. So you can see how important it is not only to understand your business, but that it is also absolutely necessary to know how to sail your craft and keep in the safe channels, for the reason it is absolutely necessary for you to know "what is your cost of doing business." No matter how much money you take in, if your goods and your overhead expense cost you more than you get for the goods, it will take all of your proceeds and some of your principal to pay for the goods and overhead expense, and it will be only a short time until your business will be undermined and you will be numbered among the 5,000 of some other day. If you don't believe this, just read the trade papers and learn where business men started in a business under such favorable conditions, and in a few years wound up with liabilities at anywhere from \$5,000 to \$150,000 according to the size of the concern.

Accounting System

If you really desire to put your business on a business basis and run it as it should be run, you can install an accounting system at a very little expense, at least a very little extra

expense, and this will be more than compensated for by the savings that you will make by doing so.

As I have mentioned, any bookkeeper using the double entry system can systematize your business so that you will know right where you are, and I will make the following suggestions. Some of these you are now doing, some you are not and there are some of you who are not doing any of them, I firmly believe.

Cash: Keep a close account on all cash coming into your business or going out. It makes no difference if you are the proprietor, if you take in 10 cents, put it in the cash drawer, not in your pocket. That 10 cents does not belong to you, yet. It must be accounted for. If you pay out 10 cents for sealing wax or whatever it may be, charge that to your expense account and credit your cash account.

Merchandise: Keep an absolute check on every dollar's worth of merchandise that comes into your store or goes out. If you sell a piece of merchandise, credit your merchandise account with the gross proceeds and credit your inventory account with the cost of the goods. When you buy a bill of goods, charge this to your merchandise account in full, and when you have balanced your account at the end of the month, you should have the exact worth of goods in your stock.

Repairs: Keep your repair business absolutely separate from your merchandise and all money received for repairs, credit repair account and charge your cash for the full amount. When you buy material, charge this material to your repair account so that you will know what your material is costing you monthly.

Expense: Under the heading of expense comes your largest item and the one with the most loop holes, and where the most of your leaks come in. Under the heading of expense, first charge interest on the net amount of your total investment at the beginning of your business year, exclusive of real estate,

Charge the store rent to expense. In case you own the property, charge your business with what it would rent for on the market to anybody else. Do not labor under the illusion that it doesn't cost you anything, because the money invested would bring you returns if you were renting it to somebody else, and is worth market value to you in case you use it. (Keep your real estate separate from your business.)

Charge, in addition to what you pay for hired help, an amount equal to what your services would be to others, and credit your personal account with same, and in case any member of your family is employed in the business, charge up a salary that this person would be worth if working for your competitor. These salaries may not necessarily be paid out to your family as salaries, but should be charged to expense and can be credited to your personal account.

Charge depreciation on your fixtures, tools or stock, or anything suffering from wear or age, etc.

Also charge up all amounts donated to churches, lodges, etc., or subscriptions paid; in fact, any item that you pay out money for that is not for resale, because if you pay it out for something and do not have the opportunity of selling it again at a profit or for what it cost you, it is an expense. Also charge all fixed expense, such as taxes, insurance, water, lights, fuel, advertising, drayage, express, postage, office supplies, etc., or as mentioned, every dime that goes out that does not buy goods for resale.

Charge up to expense or loss and gain, losses of every character including broken or damaged goods, goods stolen, dead beat accounts, in fact anything that is a loss.

Charge all collection expenses and lastly, when in doubt, take the safe side and charge any expenditure to expense. Then at the end of the year when you ascertain what the sum of all the foregoing items amount to, you will have your total expense for the year. Then divide this figure by the total of your sales, cash and time, and it will show you the per cent. it has cost you to do business. You may think this impossible, as your gross receipts are more than your expense, you say you cannot divide the smaller figure by the larger, but in figuring out this

expense item, you will simply add ciphers to your expense amount in order to do so.

When you have done this I will bet you \$4 it will open your eyes wider than any other thing you have done in years. I was simply astounded when I worked this out the first time, and it made me begin to look for the leaks in my expense account, and to stop them up. I have succeeded in stopping a great many of them, and am still busy plugging the holes.—J. H. Lepper, Iowa Retail Jewelers' Association.

HOW MANY MILES OF ROADS HAVE WE GOT?

The United States Department of Agriculture is now gathering information which, when complete, should not only give the total mileage of public roads in the United States and their cost, but should serve as a basis for estimating the relative value of the different kinds of highways. Some 15,000 sets of inquiry blanks have already been distributed through the state highway commissions, and some of these are now beginning to come back to the Department. Each set consists of four cards.

Of these the first asks for information on the mileage of different classes of roads in the county to which it is sent, and does not include streets in cities and towns. The roads are divided into ten classes, as follows: Brick paved, concrete, macadam, with the addition of some substance such as asphalt, oil, or tar; plain macadam, gravel, shell, other hard surfaced roads, sand and clay mixture properly graded and drained, ordinary earth roads properly constructed, and, finally, unimproved roads.

The second card asks for information in regard to the tax rate for the roads and the amount of work and money expended on them.

The third blank is concerned with the names of local road officials, and the fourth with facts in regard to the bond issues and the indebtedness of the counties for their road systems.

As there are approximately 3000 counties in the United States, in many of which the mileage has never even been estimated, it is hardly probable that this preliminary survey will be exact. The Department, however, will be able to detect any excessively inaccurate reports for the road mileage per square mile of territory does not vary excessively. Except in desert or undeveloped country less than half a mile of public road to every square mile of territory is rare, while in the most thickly populated rural sections the maximum is no more than 2½ or 3 miles. Thus, in France, there is an average for the entire country of 1.76 to a square mile. In Italy, however, this has fallen to .86, possibly on account of the mountainous character of much of the peninsula and of Sicily and Sardinia.

In America the average is approximately .80 miles, which, in view of the fact that much of the country is sparsely settled, seems unduly high. An explanation, however, is to be found in the fact that in many states the law provides that each section line shall be a public road. Thus, for example, there are in the state of Iowa alone more than 104,000 miles of legal highways, manifestly a much larger mileage than is required by traffic.

When the information in regard to the existing roads which the Department is now seeking is complete, it is the intention to continue the inquiry year after year in order to ascertain the durability and economy of the various kinds of highways.

AUTOMOBILES GIVEN "HORSE LAUGH"

The horse is not only king of beasts in Ohio considering the amount of money invested in various classes of domestic animals, but the equine can give a "horse laugh" to those who boast that the automobile has outstripped him, says a Columbus, O., daily.

To prove his right to the crown, the horse can cite records in the tax commission of Ohio, which show that the taxable value of all the equines on the 1914 grand duplicate amounts

to \$99,099,174, while the sum for automobiles is but \$34,571,302.

Tax figures also dispute the statement of some that the horse industry is going backward and of others that it remains stationary, for since 1913, when the taxable value of all horses was \$92,512,504, there has been an increase of approximately \$7,000,000. All automobiles in use in Ohio were on the tax duplicate for \$25,804,992 in 1913, the 1914 figures showing an increase of \$9,000,000.

There are only three counties in the state, Cuyahoga, Hamilton and Franklin, in which the taxable value of automobiles exceed that of the horses.

OH! BE JOYFUL

Under any conditions, the European countries will be coming to this country for horses in large numbers for three or four years to come. That means that horses will advance in value and the farmer who depends upon the market for his supply will find it necessary to pay more money for them than ever before. It also means that the farmer who keeps a couple, or more, brood mares, and raises a colt each year will not only be independent of the rising market for his work horses, but he will also be in a position to supply to those who must buy and take advantage of the good prices which are sure to mark the next several years in this branch of the live stock market. Just now there is no better form of insurance for the farmer to take out than is presented in a couple of good brood mares.

The above is from The Rural Spirit, Portland, Ore., and if one would merely accept conditions superinduced by the European war as an evidence that after three or four years following its close there is going to be another shrinkage in the horse market, he would be fully justified in taking this view of the matter because of the way the subject is being handled by, strange to say, some of the horse papers of the country.

Heaven bless us! the call for horses in the European war does not represent the smallest part of the drop in the bucketful of the number that there are in the United States. All told, not more than a quarter of a million horses will, it is believed, go over to Europe to supply the needs of the allies during the progress of the war. Perhaps after the conflict has closed, another one or two hundred thousand head will be exported for breeding or farm purposes. But what does this amount to? The total means less than one-half million or one-hundredth part of our possessions in horse stock. It is going to take a great deal more than the biggest conflict that the world has ever seen to put a dent in the prominence of the horse market of the U. S. and, indeed, "this great deal more" is always with us in the constant growth of the country and the increased variety of demands that is being put on the "Noble Animal," which demand instead of decreasing will grow just as the spirit of the country will demand.

But again we repeat, the time to make most money out of horse breeding is right now by following the advice conveyed in the article from The Rural Spirit.—Horseshoers' Journal.

OVERLAND PLANS BODY PLANT FOR INDIANAPOLIS

The building formerly occupied by the Willys-Overland Co., Toledo, O., at Fifteenth street and the Big Four Railroad, Indianapolis, Ind., will be converted into a plant for special automobile body construction work, according to plans outlined by J. N. Willys, president of the company. Modern machinery will be installed and employment will be given to approximately 500 men.

FALCON MOTOR TRUCK CO. ORGANIZES

The Falcon Motor Truck Co. has been organized in Detroit, Mich., to manufacture the Falcon 1,000-pound truck selling at \$750. The incorporators are: A. B. Mallow, of Detroit; F. B. Houston, of South Charleston, O., and A. B. Hazzard, of Detroit.

Paint Shop

A LESSON IN VARNISHING FOR BEGINNERS

The young painter will find himself in many an awkward position with varnishing. This is his schooling, and although disagreeable, becomes in time part of his stock in trade. The knowledge he gains makes him more observant of small details. Though perhaps these may appear insignificant at the time, they will be appreciated by him at their true value later on.

A few of the deviltries incidental to the varnish room and the cause thereof will act as a guide to the budding journeyman. In the first place, when a fresh can of varnish is to be used, it is advisable to remove the cork or capsule a few hours before using. In the case of a finishing body varnish, remove the cork, cover the opening with a piece of fine muslin, and allow to stand a few days in that position. By that time any gas or foul air has a chance to escape. No matter how often you may have used any particular brand of varnish with best results, there is always an element of chance with a new can of varnish, and you may meet with disaster when least expected. The act of drawing the cork from the can has to be carried out, if not today, tomorrow, but by doing it in time you may escape trouble. We have no knowledge as to where the goods have been stored previous to receiving them from the merchant.

The following illustration will sufficiently explain a deviltry painters are very liable to meet. The writer in his younger days had been using a certain brand of varnish with good results. A fresh tin was opened and a coat of finishing body applied on a good job. It was noticed as the work was carried on that the panels appeared as though very fine sand had been mixed with the varnish. Thinking this would flow out the body was finished but the whole body was the same and remained in that condition when dry. The painter being young and inexperienced could not explain why it should go in this manner, so had to consult his employer. He put the blame on the wood stove in use. Likewise the painter. Result, the stove was removed.

To find out the cause the writer consulted a seasoned painter working in another factory. He at once blamed the varnish, which had evidently been stored in a cold place. The gum or the dryers had become crystalized, forming minute specks distributed throughout the contents. To prove this, a small portion of varnish was poured on to a sheet of glass direct from the can; the glass was placed in an upright position, thus allowing the varnish to flow out itself by gravitation. On examining a short time after, the same sandy finish was evident.

To still further prove this, the can was placed on the smith's fire alongside the flame for two days. It was then tested and found correct; the heat had restored the varnish to its natural heat and the particles that had formed had been re-dissolved, putting the varnish in a fit condition for use. The work was flattened down and varnished with this same varnish.

This was the means taken to clear up a difficult problem, and proved successful. The bit of worry the painter experienced also did his service. He had it impressed on his mind that in order to secure himself against a repetition of this evil he only had to test a little of the goods (which would not take five minutes) to ensure himself in the future.

Crawling

Crawling is when a varnish will gather up in ridges, and is caused by oily or greasy matter on the surface of the work. This may be the result of using water that has soap in it, or using sponge or "shammy" that has been used for dirty work.

A separate sponge and "shammy" should be kept for this work only. It would also be caused by the previous coat of varnish or varnish color sweating out after flattening down. All body work if it has been flattened down the previous day or longer, should receive a light rub with the wet rag, followed by a good wash off previous to applying the final coat.

When re-varnishing old work, you may go to no end of trouble and have a good surface to finish on. The work may appear satisfactory for a considerable time and yet crawl. To guard against this, adopt the following method: When the work has had a final wash off, take a piece of silk or any old material that will not leave any fluff or lint on the work; saturate this with pure turpentine and give the panels a wipe over with it. Do not attempt to dry off, as it will quickly evaporate itself; dust off lightly and varnish. This is a very small item to carry out. It cannot do any harm, but it may save you the cost of re-varnishing a body occasionally.

Cracking

Cracking of varnish is mostly caused by imperfect hardening of undercoats. If the undercoat of varnish or varnish color is soft, in hardening up they are, in the natural order of things, bound to contract. To do any varnish justice, whether it be a hard or an elastic one, it should have a fairly hard surface or foundation on which to operate. One of the reasons why the cheaper class of work cracks lies in the fact that the painter, in order to get as good finish as possible under a time limit, applies a full round coat of varnish color. This class of work is not allowed to occupy paint shop space too long; it is usually varnish color one day and varnish the next. This undercoat, although perhaps hard enough to stand flattening the following day, is nevertheless soft underneath; which you may demonstrate by breaking the outer skin with the finger nail. You will then have proof that it takes more than 24 hours to harden thoroughly a full coat of varnish color.

When the base of your gloss coats is in a fit condition you, by applying another coat, virtually seal up this moisture. Such places have no possible hope of hardening up, unless it be at the expense of the finishing coat. If work is turned out under these conditions during hot weather, what is the result?

Blisters

The soft paint underneath will under excessive heat start to rise in the same manner as water on the boil; not so pronounced, certainly, but the same action in a modified degree. In such a set of conditions the soft parts start to give off gases. The outer skin, being fairly hard, resists this to a certain extent; but owing to pressure underneath they are forced to rise, which they do in the form of a small dome or blister. The soft parts in cooling off will also harden up and assume a normal condition; but the outer blister, being hard when subjected as forced outwards by the action of the soft undercoating, remains in that condition. If one tries to force these blisters back the probabilities are you will fracture them beyond redemption. You may, if the blisters are no larger than a small pea prick them with a fine needle and force them back with the point of the finger, but even this is not to be relied on as an absolute cure.

Deadening or Sinking In

Chief among the causes of this evil is coal gas. Its source may be from badly constructed shops whereby the fumes from the smith shop penetrate the paint shop; not an uncommon thing. Heating the room by gas, unless the ventilation is perfect, is bad for varnish. It will poison the air sufficiently to deaden any coat of varnish, either rubbing or elastic. The

more elastic the varnish is the more sensitive it appears to be, but that may be accounted for by the fact of it taking longer to dry; in which case it would be exposed to the fumes much longer while in a wet state.

Crumbling or Rusting

We very often see varnish going rusty, having the appearance of a yellowish powder in patches. This will occur when a low grade varnish is used.

Varnish will also perish rapidly when exposed to any of the following: Exposure for a length of time to sea air; to ammonia from the manure heap; dampness in the coach house.

Of the above the ammonia is the most destructive agent we have to contend against. It absolutely destroys any varnished surface it comes in contact with. Should the painter have any complaint about his varnish perishing, it is his duty and his right also to ascertain at once the conditions under which the vehicle is stored. In the majority of cases ammonia will be found doing the work most effectually.—Australasian Coach-builder and Wheelwright.

ROUGH STUFF, ITS MISSION, AND METHODS OF HANDLING AND USING IT

Like a voice crying in the wilderness, the prediction of the prophet has long gone abroad heralding the advent of some magic material qualified to take the place of rough stuff and its allied substances, but thus far the mysterious surfacing medium has figured merely as a child of the imagination.

In all the essential particulars required of a filling up and surfacing agent, rough stuff—the good American filler is quite sufficient for the purpose—holds an apparently impregnable position. Here and there, at long intervals, have appeared claimants for the coveted place of honor, but the efforts of the bold inventors to successfully displace rough stuff have proved unavailing.

No material has the required body, the strength of film and the property for surfacing to a fine, smooth surface like unto rough stuff. It is the surfacing pigment par excellence for bodies, and, despite the expense attached to using it, there is nothing in sight worthy to be called a competitor.

Notwithstanding its great usefulness in the field of carriage and car painting, it has been made to serve the purpose of those opposed to its use through the negligence and the unskillful mixing and brush work of painters who ought to know better. Much of the "grainy," unfilled and generally inferior appearance of carriage surface is due, not to the inadequacy of the filling coats to perform the mission for which they were made, but rather to wrong or incompetent methods of handling an application. In the rush to get work through the shop—a practice not only encouraged but demanded by the public—insufficient time is allowed the filling coats, and especially rough stuff, to dry out hard and clean from top to bottom. If it looks dry and feels dry upon the surface, it is passed along for the next coat, whereas it should perhaps have at least another day in which to harden.

The recommendation of the manufacturer is too often accepted as the guide to the prescribed number of coats per day to apply, when, as a matter of fact, the condition of the shop, its temperature and certain important local circumstances should govern the number of coats to be applied, and the frequency with which they may be so applied. The rough stuff that is not thoroughly hard from top to bottom—"bone hard"—as the painter puts it, is not only a very dangerous material to clinch beneath coats of color and of varnish, but it is a material which does not surface down smoothly, and offers a soft, porous surface, honey-combed with suction reservoirs, into which the succeeding coats are drawn to an extent sufficient to rob them of needed vigor and brilliancy.

Soft, imperfectly dried coats of rough stuff, or other surfacing coats, are unquestionably responsible for no small share of the graining out, and the loss of luster, and the generally impoverished look of the finished surface. In good truth, the

critics of carriage painting may well file a plea for more uniform and better dried foundation coats. And not only better dried coats, but coats more skillfully and carefully applied.

An excess of everything but skill is possible in painting and finishing the modern carriage. It is not an extravagant statement that an excess of skill is impossible. Rough stuff differs from all other materials used in bringing the carriage to a finish, in that it properly should go to the surface a little heavier in body than other material. If properly mixed, it will do this and flat out quite free from brush marks. And brush marks, if it please the reader in passing, are alien to the soil of which good painting and finishing are made.

It is this chase after brush marks up and down the highway of the surface that results in the "thick-and-thin" foundation, and the undisguised lack of uniformity of the finish. Brush marks contribute their full share toward the surface that "grains" out, or looks poor and miserable in body, or casts away its brilliancy and shifts the whole face of its beauty. Moreover, as the good master of the surfacing department will tell you, brush marks in the rough stuff—yea, more, in the coats preceding the rough stuff—will retain their shape and outline to the end of the whole finishing process. As an acknowledged expert has said, "Once a brush mark always a brush mark."

Rough stuff should always be brushed out smooth and fine, and to a compact film. To do this a good brush, with a soft, fine point and plenty of elasticity and an easily controlled body of bristles, is one essential. A trained, skillful and disciplined brush hand is the second essential.

The practice of laying coats of rough stuff horizontal and vertical, alternately, is to be commended. Indeed, it is the best practice, and in first class shops it is pretty generally observed. It results in a denser and more compactly knit foundation, and yields greater uniformity in the depth of material applied.

Rough stuff should be mixed only for present requirements. It is a material that, under apparently perfect conditions, sometimes gets "fatty," and, under the conditions which usually prevail in the paint shop, it is more than likely to reach such a condition if made up in advance of daily needs.

It should be kept well massed when mixed, and in a pail or can tightly closed to exclude the air and dirt, for, of all materials used, it is the least clean. Its mussy nature and quick-drying character renders it an undesirable pigment to hold in stock in open receptacles ready prepared for use. If purchased ready prepared for use, and the shop is a comparatively small one, it is economy to order it in one-gallon cans, as a saving in material and a better conditioned pigment will be the result.

And it is an open question if it is not more economical for the painter in the small shop at least to buy his rough stuff ready mixed. The manufacturer is now furnishing the pigment mixed to suit all the requirements of the trade—quick, medium and slow drying, so called. With many painters, of course, it is a matter of the utmost concern that they should know the quality and the exact proportions of the materials composing the stuff. It is important, to be sure, that rough stuff be made of first class materials, not of the odds and ends of turpentine, japan, varnish, etc. But when buying of a reliable manufacturer, the purchaser is not likely to be misled.

As a matter of fact, the painter buying his rough stuff ready mixed is to no greater extent at the mercy of the unscrupulous juggler of mixtures and materials than he who elects to buy the necessary ingredients and mix the rough stuff supply to suit his convenience. In either case it is a matter of buying of the thoroughly honest and reputable manufacturer or jobber, who deals with a reputation at stake and with a determination to sustain it.

It is generally understood, or should be, that it is desirable to use the least number of coats of rough stuff consistent with good surfacing. The burned off surface, as a rule, by reason of its possibly greater inequalities will require more rough

stuff to insure a level and wholly intact surface than the new surface dressed to machine and deft hand perfection. Upon the latter surface four carefully applied coats of stuff will ordinarily suffice to furnish a first class finish, other things being equal. The burned off surface will not infrequently need five coats of stuff, and quite often an additional coat, to insure a finish of the first order.

HOW TO STRIPE

It has been said that a good mechanic can work without tools, and, indeed, it would be better to try good work without tools than to attempt the same result with poor tools. This is particularly true of striping, for the expert will fall down here if he is not provided with a suitable pencil for the purpose. A long, supple pencil, with just enough hair for the size stripe, is needed. Fill the pencil well with color, and hold it so that the heel of it will be slightly raised when using it. For the beginner, a somewhat slow color is most suitable, for then he can easily wipe off the color should his effort be unsatisfactory. If he is practicing, I would advise the use of straight lines rather than curves at first, though it is very good practice to work at circles, which will help you acquire facility of wrist and hand in the making of more flowing curves. The expert striper needs no such advice, but the inexperienced does. And this article is intended for the latter, among whom may be found many who have had plenty of experience as painters, with but little as stripers. Let me say that you will need to take your gaze from the pencil occasionally, and watch the path that the pencil is to take, dividing your attention between the two.

To make a curve line, use the point of the pencil, adding some pressure as the curve approaches a straight line into which it is to merge. The short curves are made with short pencil, say an inch in length. Striping pencils vary in length, those that are one inch, two inches, and two and one-half inches long being for fine lines, although the two last named answer as well for border lines, say for stripes of one-quarter inch and upwards.

Striping is less difficult upon a horizontal surface than upon a vertical, but one cannot always choose the position of the surface. In making a stripe upon a vertical surface, or one that has considerable inclination, the color is inclined to flow into the heel of the pencil, and hence the paint won't flow from the pencil as it should. Upon the other hand, striping in a reverse position, the pencil's point being downwards, the color flows to the point, and the result is that there is an over-flow of paint. These are samples of the difficulties that the beginner in striping will have to face, and he will have to patiently practice until he has mastered the matter.

Let him practice with pencils of every size and sort, and upon surfaces on different inclination. Wheel spokes are about the easiest thing for him to practice upon, while the felloes and hubs are more difficult to do. Fortunately, however, hub lines are in such a position that even should they be made irregularly, the fact is not very perceptible to the casual observer at least. Just so he makes ends meet. That is an ever recurring proposition, too. Revolve the wheel somewhat briskly, keep your pencil full of color, and maintain a steady hand. Use the dagger pencil for hubs, as it holds more color than the other kind, and is at the same time more supple. Give the wheel a turn, place the dagger pencil in position, and let 'er go. Don't get nervous. If a failure the first time, try again.

Another thing you will have to learn by practice is to mix the striping color properly, so that it will flow nicely from the pencil. Make it as thin as possible, without making it too thin to cover well. The color must flow freely from the pencil to make a good stripe.

And let me tell you how to piece out a stripe. When a very long stripe is run the color becomes exhausted from the pencil before the line is done, and you will be obliged to fill it up

again. The trouble will come when you replace the pencil on the stripe, the probability being that you will cause a break to appear at that part of the stripe. The way to avoid this is to lay the pencil gently yet firmly down upon the stripe, about an inch or so back from the end you left off, then press the pencil until the right width of stripe is made, when the pencil may be drawn forward and the stripe finished. With a little practice this trick is easily mastered.

Striping pencils are made from sable, ox and so-called camel's hair. Sable and ox hair are more springy than camel hair, with greater strength of fibre, and do not sag under the weight of color as camel hair does. The beginner, especially, will prefer the ox and sable hair pencils.

Learn to care for the striping pencils. When done using a pencil, grease it with a mixture of tallow and sweet oil, press the hair out into shape, and then lay it away in a clean and dust-proof place.

OUTPUT OF MINERAL PAINTS INCREASED BY "CLEAN UP, PAINT UP" CAMPAIGNS

Statistics compiled by J. M. Hill and just made public by the United States Geological Survey show a greater production of mineral paints during 1914 than in 1913. This increase is particularly marked in the white pigments made from both lead and zinc, and is of interest as showing the results of the "Clean up, Paint up" campaigns which have been in progress.

In 1914 there were 66,566 short tons of domestic ocher, umber, sienna, mineral paint, mortar color, and ground slate and shale sold, which was less by 4,029 tons than the sales of similar pigments in 1913. The output of white pigments—zinc oxide, leaded zinc, and the basic sulphate of lead produced by sublimation showed an increase of 10 per cent. in value over 1913. During 1914 there were sold 106,791 short tons of these pigments, for \$9,978,710.

The lead pigments made chemically, including basic carbonate white lead, litharge red lead, and orange mineral, and the chemically prepared zinc barytes pigment lithopone likewise showed a decided increase; 245,206 short tons of these pigments were sold in 1914, for \$27,621,829.

PAINTING HAND RAILS

In a recent issue of *Electric Traction* the following appears: With the cars operated on the Ft. Wayne city lines of the Ft. Wayne and Northern Indiana Traction Co., considerable difficulty was experienced in keeping the hand rails back of the driver's position attractive in appearance. It was impossible to keep the cars out of service long enough for paint on the pipe railings to set thoroughly, and often it was necessary to place them in service when the paint was sticky. As a consequence, the railings were almost constantly in need of a fresh coat of paint. Mr. A. W. Reddersen, superintendent of motive power, overcame this trouble in the following manner: First, the pipe was thoroughly cleaned and then given a coat of shellac. It was then wrapped with linen tape, while the shellac was still wet, and the tape given several coats of the ordinary orange shellac. This covering has the advantage of setting quickly, and has been found to wear well—much better than the paint—and presents a neat appearance, as it has a glossy surface.

ALUMINUM PAINT

To fix up and use aluminum paint, simply put some pulverized aluminum into gasoline, stir it up and apply the mixture with a brush or dip the articles if small and let the surplus drain off. Aluminum paint, thus applied, dries in a minute or two, and sticks closer than you think possible. In fact you will have to scrape it off to remove it and the coat thus applied will not rub or smut, but will last for years. A second or even a third coat may be applied in a few minutes and the article will be ready for use in a few minutes more.

NO "KICK" COMING

That the automobile has cut a wide swath in the carriage and harness making business every one will admit, yet it cannot be said that the sales of popular priced carriages and harness has decreased to any great extent, as there are now as many or perhaps more horses in the United States as there were ten years ago. But it is certain that had the automobile not been invented there would have to be double the number of horses and vehicles in use today. Consequently these businesses would have doubled themselves.

The fact is, the harness business like the carriage industry, is not less extensive than it was ten years ago. These industries simply have not expanded as they would have done in the absence of automobile competition.

However, neither the carriage nor the harness makers have any "kicks" coming, and wherever you go you will find the carriage and harness people listed as among the classes who do not complain. Indeed, in many instances harness manufacturers have turned their attention to some specialty from which they have derived more prosperity than was ever thought attainable in regular lines, while it is well known that hundreds of carriage and wagon builders have found the building of motor car bodies a profitable side line.

BAKER AND RAUCH & LANG COMPANIES UNITE AS BAKER R. & L. CO.

The Rauch & Lang Carriage Co., and the Baker Motor Vehicle Co., Cleveland, O., both well known manufacturers of electric passenger cars have merged into one, and henceforth the two concerns will operate as one under the firm name of Baker R. & L. Co. The agencies of the two companies will be combined in all cities.

In order to bring about the merger Rauch & Lang increases its capital stock of \$1,000,000 to \$2,500,000, of which addition \$750,000 is 7 per cent. preferred and the balance common. The capital stock of the Baker Co. is \$600,000. This gives a total capital stock of \$3,100,000. In order to complete the merger inventories and appraisals are being made but for all practical purposes the business of the two firms is now being conducted as one. It is not known whether the name of the cars will be changed in any way to conform with the new organization.

In the list of officers many of the old officers of both Baker and Rauch & Lang companies have been continued and are as follows: President, C. L. F. Wieber, president of the Rauch & Lang Co.; first vice-president, F. R. White, vice-president and general manager Baker Co.; second vice-president, Chas. E. J. Lang, vice-president and treasurer Rauch & Lang Co.; treasurer, R. C. Norton, treasurer Baker Co.; secretary, G. H. Kelly, secretary Baker Co.; counsel, F. W. Treadway, secretary Rauch & Lang Co.

FORD CO. CAPITAL STOCK INCREASED TO \$100,000,000

An increase of the capital stock of the Ford Motor Co. from \$2,000,000 to \$100,000,000 has been authorized by the directors. It is explained that they desired to make the earnings more in proportion to the value of the business.

Immediately after authorizing the increase the directors voted a stock dividend of 2,400 per cent. or \$48,000,000. The remaining \$50,000,000 in stock will remain in the treasury for future dividends.

It is said that Henry Ford, president of the company and holder of 58 per cent. of the stock, receives a stock dividend of \$28,080,000, making his total holdings \$29,250,000. James Couzens, vice-president and treasurer, receives a stock dividend of \$5,472,000, making his holdings \$5,700,000.

David Gray will receive a dividend of \$4,800,000, making his holdings \$5,000,000. John F. Hodge, Horace E. Dodge, Horace H. Rackham and John W. Anderson, each holders of 1,000

shares, will receive each \$240,000 in stock, making their holdings \$2,500,000 each. R. V. Couzens, holder of 20 shares, will receive \$48,000 in new stock, making his holdings \$50,000.

In the last statement of the company as of September 30, 1914, a surplus of \$48,827,032.07 was reported. Total assets were given as \$61,632,257.16, of which \$27,441,468.79 was in cash.

KELLY-SPRINGFIELD TIRE PLANT ON 24-HOUR SCHEDULE

The plants of the Kelly-Springfield Tire Co., at Akron, O., are operating a 24-hour-a-day schedule. Business already contracted for calls for a continuance of this rate of operation during the next six months at least.

The first week in June sales showed an increase of 72 per cent. over the same period a year ago, and in the previous week the gain was 100 per cent. Business so far this year is running at the rate of \$8,000,000. The 1914 sales were approximately \$5,000,000. The company is now putting out 1,000 tires a day, or at the rate of over 300,000 tires a year.

Large earnings, said to be close to 30 per cent. on its common shares compared with 22 per cent. in the year ended December 31 last, will probably bring forth an extra disbursement on that stock as a cash dividend this fall.

Kelly-Springfield Tire Co. has declared a regular quarterly dividend of 1½ per cent. on first preferred and 1¼ per cent. on second preferred, payable July 1 to stock of record June 15.

NEWARK, N. J., LEATHER MEN RAISING FUNDS

The committee of 300 named to solicit funds for Newark's 250th anniversary celebration to be held in 1916, includes the following well known leather manufacturers of that city: Abe Rothschild, of Stengel & Rothschild; James E. Rielly, of P. Rielly & Sons, and J. Henry Smith, of T. P. Howell & Co. Carriage hardware men, leather manufacturers and other interested in the carriage business are generous subscribers to the \$250,000 fund which is being raised. Among the contributors are the Tanners Leather Co., the Murphy Varnish Co., Stengel & Rothschild, Kaufherr & Siegel, Apex Leather Co., the John Reilly Co., P. Reilly & Son, Kaufherr & Co., the W. T. Crane Carriage Hardware Co., Eclipse Tanning Co., E. S. Ward & Co., Blanchard Bros. & Lane, G. M. Aschenbach Harness Co., George Stengel, Inc., Seton Leather Co., employees of Phineas Jones.

CALIFORNIA ADOPTS NEW REGISTRATION FOR MOTOR VEHICLES

A fixed registration fee of 40 cents per horsepower, S. A. E. rating, was adopted by the state legislature of California during the recent session. This new amendment to the motor vehicle act accomplishes an annual saving of about \$50,000 by allowing owners to keep their same number plates and re-register them each year. One section of the amendment requires all horse-drawn vehicles as well as automobiles to carry lights at night. The former law taxed automobiles under a blanket rating covering of from 10 to 20, 20 to 30, etc., horsepower.

CHALMERS MOTOR CO. EXTENSION

The Chalmers Motor Co., Detroit, Mich., has just given authorization for the erection of a four story 90 x 60 foot addition to building No. 5, which is devoted to the manufacture of motors and other parts. All departments in this building will be enlarged to facilitate the needs of a much greater output. Plans have already been drawn, and work on the new steel and concrete structure will begin at once. The work will be rushed through to completion as quickly as possible.

A SUBSTITUTE FOR GLASS IN AUTOMOBILES

For many years it has been one of the endeavors of automobile body manufacturers, especially of limousine and sedan bodies, to find a substitute for the dangerous glass, used as windows in these motor cars. Several types of "safety glass" have been proposed, but for some reason or other it has been found impossible to eliminate the splintering glass with its danger of cutting the passengers in a collision. In tops for touring cars, on the other hand, celluloid and mica have also been found very unsatisfactory, and their use has been continued for the simple reason that nothing better so far has been discovered.

Now, however, a material has been brought out by one of the largest manufacturers of explosives in the world, under the trade name Cellon, which possesses some remarkable qualities. In the first place, it is almost unbreakable by ordinary handling. Sheets of this material can be bent backward and forward many times, without breaking; blocks of this transparent product can be subjected to blows without showing fractures; it can be produced in any desired thickness, up to half an inch, in plates measuring 140 by 60 centimeters. In rods and tubes the material can be had in any desired thickness. Clear and completely transparent, light or dark colored, mottled or even black, it can be used for the manufacture of all objects now made of celluloid.

Its chief advantage over celluloid is its safety against fire. A sheet of cellon may be ignited by an open flame, but the burning portion will melt and a few drops of the material will fall to the ground. It will not continue to burn. Its weight can be calculated for any desired thickness and size from the statement that a plate 60 by 140 centimeters, 1 millimeter thick, will weigh 1 kilogramme. Translated into inches and pounds, the material weighs about 2.6 ounces per hundred square inches of 0.04 inch thickness.

Cellon is fastened by nailing it down, thin sheets by sewing on; it can be glued on by the use of "cellonlack." It is used for telephones, electric switch boards, toilet articles, windows for automobiles and aeroplanes and dirigibles (see Zeppelin passenger ships), and is a perfect isolating material for all electric apparatus; can be cut and trimmed with an ordinary knife; warmed in hot water and then molded in any desired shape; is impervious to water, gasoline, petroleum, oil, turpentine, and gas.

Cellon-lack, the new varnish made with cellon as a base, promises to become invaluable as a varnish for aeroplane and balloon materials, because of its resistance to the influence of gasoline, oil, and water. Instead of reducing the tensile strength of these materials, cellon-lack is said to increase it.

While at present there seems little chance of this material being introduced in the United States, says Scientific American, the end of the present war will undoubtedly see its use in American industries. The process of manufacture is patented by Dr. Eichengruen, in Germany.

USED CARS IN GERMANY AFTER THE WAR

The American Association of Commerce and Trade in Berlin publishes in its weekly report on trade conditions in Germany, the following item regarding the used-car question after the war. It emanated from Mr. Ernst Berge, manager of the Daimler-Motoren-Gesellschaft, the builders of the famous Mercedes.

This question will surely arise, owing to the fact that thousands of cars used in the war by the German armies will, at the close of the same, be thrown on the German market.

There will be three distinct classes of used cars to be considered, the "veterans" or those in perfect condition, the "half-invalids" or those which are in need of repairs, and the "invalids" which are beyond repairs and which may be regarded as scrap.

The "veterans" or perfect cars, for which the war was only

a sort of training, will be retained for military service. The "invalids," which are nothing more than scrap, will be sold as such. The "half-invalids," however, will, if put in good order, eventually represent a danger to the legitimate automobile trade, for which reason precautionary measures have been taken to prevent an overflow in the used-car market.

All cars, discharged from military service, will be taken over by a special company founded in Berlin and headed by the representative interests of the automobile industry and the army authorities.

This company will take over all such cars, worth repairing, put them in good order and then put them on sale. These repaired cars, however, will not be put upon the market at one time; the sale will be regulated to the demand, thus preventing a depression on the market.

In order to accomplish this end, the sale of these cars will extend over a period of three years, so that from year to year a limited number only will be offered for sale.

It should be pointed out that the above-mentioned company does not expect to derive any profit from this business.

If after the period of three years all repaired cars have been disposed of, the participants in the company, which in reality seeks no monetary gain, will receive their invested capital. An eventual gain will be turned over to the military authorities.

In such way two results will be achieved: firstly, the automobile market will not be flooded with used cars, and secondly, a great number of good but low priced cars will be available for all classes of people and thereby produce new enthusiasts for automobilism.

ORIGINATED THE "TALLY-HO"

There passed away in New York City on the 5th of April a man whose whole life was spent in the furtherance of coaching and the breeding of the best kinds of coach horses. He was not a coach builder, neither was he a breeder of horses, but Col. Delancey Astor Kane was an international authority respected by every coach builder and every horse breeder.

Col. Kane was a descendant of John Jacob Astor and inherited many millions. He graduated from the United States Military Academy in 1868.

The love for horses amounted to a passion with Col. Kane, and from early boyhood, during his military career and in civil life, he was always to be found associated with horses and vehicles. Both his time and his immense wealth were always at the service of any movement which purposed the elevation of the horse breeding and vehicle building industries.

The particular interest of Col. Kane in coaching was responsible for the popular name in America given to a four-in-hand coach.

The word "Tally-ho," which in the United States signifies a four-in-hand coach is, however, entirely incorrect. It originated in this way: When in 1876, Col. Kane first put on his road coach from the Brunswick Hotel, New York City, to Pelham Manor, N. Y., he named his vehicle "Tally-ho." This was in accordance with the old English custom of giving names to coaches, just as for many years it was the custom to christen locomotive engines, and just as battleships are named at the present day.

Col. Kane was probably influenced in his selection of the name by the following passage from George Eliot's novel "Felix Holt, the Radical": "The mail still announced itself by the merry notes of the horn; the hedge cutter or the rick-thatcher might still know the exact hour by the unfailing, yet otherwise meteoric apparition of the pea green 'Tally-ho,' or the yellow painted 'Independent.'"

New York newspapers, in writing about the new coach line called the vehicle "the Tally-ho," and other newspapers, less well-informed began to refer to all four-horse coaches as "tally-hos." Many mild protests were made, without avail, by coaching men, against such an erroneous expression, but finally

an American dictionary adopted, and gave authority to the expression. The mistake was similar to the one more recently made in regard to piano players where the trade name of one well known player is almost universally used to designate all mechanical devices for playing pianos.

JINRICKSHAW AN AMERICAN'S INVENTION

"It is not a matter of common knowledge," said the secretary of the Carriage Builders' National Association recently, "that the jinrickshaw, generally thought of as an oriental passenger vehicle, was the invention of an American citizen, resident at the time in Japan, the first vehicle of the kind having been built by a native wagon builder under the American's instructions.

"The utility of the 'rickshaw' was at once appreciated by the Japanese and the two-wheeled, one-passenger, man-drawn little vehicle rapidly multiplied until it could be found in every section of the Japanese islands.

"Its popularity has since spread until the 'rickshaw' is now a common vehicle, not only in Japan, but in northeastern India, some parts of eastern China, and the islands of Ceylon and Java.

"'Rickshaws' are made in quantities in native Japanese establishments, and are also extensively imported from the United States, most of those proceeding from this country originating in the state of New Jersey.

"Wheels, shafts and other parts, ready made, are extensively imported from America, the wheels being more frequently of wood with steel or rubber tires, but sometimes of the wire or 'suspension' type, these being also shod with solid or pneumatic tires.

"The rickshaw coolies, or runners, usually buy their rickshaws from local dealers on an instalment plan, paying about \$5 per month, the dealers by legal agreement maintaining a lien on the rickshaw until the debt is entirely paid. Local dealers in rickshaws state that the coolie is a most particular person to deal with and often spends hours in the observation of a particular vehicle before making up his mind to purchase it. Sometimes a faint, almost unnoticeable scratch on the varnish is sufficient to create an adverse judgment.

"When well-to-do persons, employing coolies for their private rickshaws, desire to purchase new rickshaws, it is always found to be the best policy to leave the selection to the coolie himself, so that his own fancies and prejudices may be satisfied; otherwise there is likely to be constant grumbling, and the coolie whenever careless or negligent will lay the blame on his master's choice of the rickshaw.

"When public rickshaws are used in Ceylon, the fare amounts to about 8 cents per mile. Most of the rickshaw coolies in Ceylon are Tamils from southern India. As a rule they make a fair living, especially when many tourists are in the island, as they ordinarily pay more generously than the legal rates require."

THE SULTAN'S COACH

The Tangier correspondent of The London Times has given an account of the fate which befell the state carriage which had been supplied to that monarch by a well known British firm. The account says: The afternoon that the carriage arrived, transported in packing cases carried on platforms, which in turn were slung between camels, the Sultan was playing bicycle polo with some of his European suite.

Like the coach itself, the purple harness, with its gilt fittings, was of the very best, and together they formed an ensemble as expensive as it was utterly useless, for there were no roads in Morocco.

The Sultan was evidently pleased. As usual he said little, but he called to one of his officers and ordered four horses to be harnessed to the coach. It had to be explained to him that no horse in the Imperial stables had ever been in harness.

But his Majesty was not going to be deprived of the pleasure of seeing his coach in movement. Men—soldiers and slaves—were harnessed and told to pull.

"We will ride in it," said the Sultan, and, beckoning to the consul of a great power to get up behind, he himself mounted to the scarlet and gold seat of honor on the box. When all were seated, the vehicle started on its first and last Progress of State. The soldiers and slaves sweated and puffed as the wheels sank deeper and deeper into the swampy ground, and the "Progress" was slow indeed.

It rained that night, and the next day the little lake of water in which the State coach stood was purple from the dye of the harness, and the beautiful hammer-cloth of scarlet and gold flapped limp and ruined in the wind. Inside there was a pool of water on the green brocaded seat.

THE ONE HOSS SHAY

Oliver Wendell Holmes, the poet and author of the classic poem entitled "The One-Hoss Shay," stands in somewhat the same relation to American carriage builders as Homer did to the ancient Greeks. Dr. Holmes wrote the one big, satisfying epic of the horse-drawn vehicle—the "Iliad" and the "Odyssey" of the carriage industry.

Logic may be logic, but carriage builders have never been able to realize the Doctor's idea of a vehicle equally strong in all its parts, so that no breakage could occur until all the parts had fulfilled their destiny and the whole contrivance go down at once to the "dreamless silence of the dust." It is one of those things which "cannot be done."

Nevertheless, the good Doctor has always been highly appreciated by the carriage manufacturers who, during his life time made him an honorary member of the Carriage Builders' National Association, a distinction which Dr. Holmes gracefully acknowledged in the following letter:

Beacon St., Boston, April 16, 1879.

Sec'y Carriage Builders' National Association:

Dear Sir:—I have received the official certificate of honorary membership of the Carriage Builders' National Association, signed by yourself as secretary. It gives me pleasure to accept the honor which your association has conferred upon me and for which I make my respectful acknowledgements. Believe me, dear sir, yours very truly.

OLIVER WENDELL HOLMES.

DIXIE HIGHWAY GETS BIG BOOST

Movement for Chicago to Miami Route Receives Impetus From Chattanooga Associations

The movement for a great highway, similar to the Lincoln transcontinental highway project, to foster the building of a great southern travel route from Chicago to Miami, has received a big boost from the automobile clubs and other Chattanooga associations.

The undertaking is the outcome of suggestions made at the fourth American road congress, held at Atlanta, Ga., last September. Soon after the Dixie Highway meeting in Chattanooga, May 20-21, it was announced that the association would open an office in that city.

The activities of the association will, as a result, come under the personal supervision of President C. E. James, of the association. It is said the association has subscriptions to the amount of \$50,000 for the highway.

The importance of good roads makes the project one deserving of substantial support.

American vehicle draftsmen who are arranging to enter their designs in the ambulance competition of the Wellcome Bureau of Scientific Research, London, are reminded that the competition closes June 30. Designs should be sent to England at once, to allow for any unforeseen delay in the delivery of foreign mail.

Trade News From Near and Far

BUSINESS CHANGES

John E. English succeeds Atwood & Akers, dealers in vehicles and implements, at Sonora, Ky.

Raymond Jett succeeds the Farmers' Supply Co. at Mt. Vernon, Ky., in the vehicle and implement business.

George O. Bailey, Auburn, Me., has sold his carriage business to E. C. Sawyer and will hereafter devote his attention to farming.

J. B. Keithly Implement Co. has succeeded to the implement and vehicle business of the Brookfield Implement Co., Brookfield, Mo.

Earl L. Smith has purchased the implement and vehicle department of the Stienbarger Hardware and Implement Store, Augusta, Ill.

F. T. White, a retailer in vehicles and implements at Chicago Junction, O., has taken his son into the business under the name of F. T. White & Son.

C. S. Williams, of Madisonville, Ky., recently purchased a half interest in the Plain Hardware Co., which will continue under its present title. The company, in addition to hardware, handles buggies and wagons.

NEW FIRMS AND INCORPORATIONS

Geo. Barton has opened with a stock of buggies at Bad Axe, Mich.

Harry Adams is a new implement and vehicle dealer at Sparta, Ill.

A. T. Anderson has opened a vehicle and implement business at Adams, Minn.

Puryear & Thompson have engaged in the vehicle business at Hartsells, Ala.

Leon Howard is opening a vehicle and implement business at Neillsville, Wis.

Shands & Bartlett are new dealers in buggies, supplies and implements at Union, S. C.

F. J. McCauley has engaged in the implement and vehicle business at Murdock, Minn.

E. G. Smith has engaged in the vehicle and implement business at Round Lake, Minn.

J. C. Schlotfeldt has opened a vehicle and implement business at South Haven, Minn.

McBee & Hamilton will engage in the vehicle and implement business at Lawton, Okla.

Perry & Cook have engaged in the implement and vehicle business at North Crandon, Wis.

The Marbury-McCoy Hardware Co., Tullahoma, Tenn., capital \$4,000, will deal in implements, vehicles, hardware, etc.

It is reported that Gayman & Sutton will engage in the vehicle, implement and hardware business at Chandler, Okla.

The Sterling Hardware Co. has incorporated at Hazard, Ky., with a capital of \$5,000 and will handle hardware, implements and vehicles.

John Hasz and Jacob P. Neubarth have formed a partnership and will engage in the implement and vehicle business at Menno, S. D.

The Farmers' Supply Co., incorporated at Hogansville, Ga., with a capital of \$25,000, will handle implements, hardware, buggies, etc.

The Anita Implement & Hardware Co., incorporated at Omaha, Neb., with a capital of \$20,000, will handle vehicles, implements, hardware and general merchandise.

NEWS OF THE TRADE

The Mogue Truck Co., St. Louis, Mo., will soon erect a new factory.

Reiss Ball & Co. have incorporated at Detroit, Mich., to manufacture vehicle bodies.

The Buick Motor Co., Flint, Mich., will build a one and a half story addition to its factory.

The Haynes Automobile Co., Kokomo, Ind., has under way extensive additions to its factory.

The A. W. Kirk Tire & Supply Co., Toledo, O., has changed its name to Kirk Tire & Supply Co.

The Federal Motor Truck Co., Detroit, has increased its capital stock from \$200,000 to \$500,000.

The Troy Mfg. Co., Troy, O., manufacturer of automobile bodies, is erecting a three-story addition to its plant.

It is reported that the Monarch Machine Co., of Altoona, Pa., will build a plant for the manufacture of motor trucks.

The Ford Motor Co., of Detroit, announced that it will build a big factory in Charlotte, N. C., to cost about \$250,000.

The Packard Motor Car Co., Detroit, has awarded the contract for the erection of a one-story brick addition to its plant.

The Globe Motor Car Co., Canton, O., will shortly begin the erection of a four-story fireproof brick, steel and concrete garage.

John Inmel, for 50 years in the carriage business at Columbus, O., celebrated the occasion of his anniversary on Tuesday, June 1.

The Signal Motor Truck Co., Detroit, manufacturer of automobile trucks, has increased its capital stock from \$60,000 to \$85,000.

The Ford Motor Co., Detroit, Mich., will double the present capacity of its plant at Kansas City, Mo., at a cost of about \$350,000.

The All Steel Motor Co., St. Louis, Mo., has acquired the Brees Buggy Co. factory at Macon, Mo., and will manufacture motor cars.

The National Spring & Wire Co., Albion, Mich., will erect an additional factory building. The plans call for a structure 48 x 100 feet.

The Fleetwood Metal Body Co., Fleetwood, Pa., has had plans drawn for a two and one-half story brick and concrete factory, 40 x 499 feet.

The American Top Co., Jackson, Mich., manufacturer of automobile tops, has acquired additional factory space and is adding to its equipment.

The Mt. Pleasant Motor Co., Mt. Pleasant, Mich., automobile manufacturer, is adding to its facilities by the erection of an addition to its factory.

Deere & Co., Chicago, Ill., have completed an order for \$1,000,000 worth of military wagons for the French army. The contract was placed in April.

The Columbus Bolt Works Co., Columbus, O., has increased its capital stock from \$75,000 to \$660,000. It is rumored that extensions to its plant are contemplated.

The Pathfinder Co., Indianapolis, Ind., has been incorporated with \$250,000 capital stock, to manufacture automobiles. The directors are C. W. Richards, G. I. Lukin and Leo Kaminsky.

The H. H. Franklin Mfg. Co., Syracuse, N. Y., will build

a three-story addition, 56 x 80 feet, to its automobile factory at Marcellus and South Geddes streets, to cost approximately \$40,000.

It is reported that the Buckeye Spoke Co., Centerville, Tenn., which has been idle several months, will soon resume operations. Enough material is on hand to provide a long run for the plant.

The Empire Axle Co., Dunkirk, N. Y., is working at full capacity with a night and day force as a result of large orders from abroad recently received for its product for use on heavy motor trucks.

Rehkopf Bros., carriage manufacturers and repairers, 207-209 West Sixth avenue, Topeka, Kas., have purchased land at 212-214 West Sixth avenue, and will erect a three-story building to cost \$15,000.

The Independent Motors Co., manufacturer of automobile trucks, Port Huron, Mich., has effected a reorganization. The new officers are A. W. Frantz, president; W. B. Ford, treasurer, and M. H. Rupe, secretary.

The Paige-Detroit Motor Co., Detroit, automobile manufacturer, will erect an addition to its main manufacturing building 50 x 500 feet, three stories. The addition will involve the purchase of considerable new equipment.

The Republic Truck Co., Alma, Mich., manufacturer of automobile trucks, has secured promises of a new plant to be financed by the Alma board of trade, and will remain in that city. The new factory will cost \$35,000.

The J. C. Wilson Co., Detroit, which has heretofore manufactured automobile bodies, has announced that it will add the manufacture of automobile trucks to its present line. It has a plant at Fifteenth and Warren avenues.

In Louisville, Ky., the Highland Body Mfg. Co. has established a branch at 728 South Fourth avenue, with A. J. and E. G. Schoen as managers. This branch will handle both wholesale and repair business in Kentucky and a part of Indiana.

The Security Trust Co. has been named trustee for the bankrupt Detroit Body Co., Detroit, Mich. Assets of the latter are listed as \$237,833.73, exclusive of book accounts, and including the company's factory and site. Its liabilities are \$329,650.71.

The Jackson Cushion Spring Co., Jackson, Mich., manufacturer of springs and spring structures, is building an addition of concrete and steel and is adding machinery that will more than double its capacity. W. R. Smith is secretary and general manager.

Joseph J. Derham, Rosemont, Pa., builder of automobile bodies, has architects' plans for a new concrete two-story plant to be erected at Thirty-fourth street and Lancaster avenue, Philadelphia. The dimensions of the new building will be 150 x 155 feet.

The Wadsworth Mfg. Co., Detroit, has been incorporated with \$250,000 capital stock to manufacture automobile bodies, etc. Frederick E. Wadsworth, Mary M. Wadsworth and Herbert E. Cronenwirth are the incorporators. It has acquired a large factory site in Detroit.

The Fostoria (O.) Light Car Co. has been organized by R. J. Ridgway, J. H. Jones, Ira Cadwallader and Charles Ash, of Fostoria, and A. C. George, of Lima, for the manufacture of automobiles in Fostoria. The capital stock is \$100,000. This is Fostoria's second auto factory.

The Gramm-Bernstein Co., Lima, O., has received orders to duplicate at once a large order for truck parts which was being shipped to England on the Lusitania. The parts were to complete equipment of trucks which had been shipped previously. The plant started on the order at once.

John Roedel, manager of the Defiance Carriage Co., Defiance, O., says the demand for the "Defiance Auto Trailer Cart," manufactured by them, is constantly growing, and that during the past few weeks many orders have been received for them,

and also that new life seems to have come to the carriage line as well.

The Briscoe Motor Co., Jackson, Mich., automobile manufacturer, has acquired a tract of land just outside of Jackson as a site for its new plant. The first unit of the new plant to be erected will be a two-story manufacturing building, 250 x 300 feet. Additional buildings will be erected as development may require.

The Kissel Motor Car Co., Hartford, Wis., which has been operating with extra forces and on overtime schedules on export orders for trucks, has booked an order for 30 ambulance trucks for the government of Serbia. The company furnished the Serbian government with 12 trucks last fall and the order is in the nature of a repeater.

The Charles S. Caffrey Co., Camden, N. J., has commenced operations in the original Caffrey factory at Tenth and Market streets. The company was recently reorganized. H. P. Burmeister, formerly secretary and general manager of the Keystone Vehicle Co., Reading, Pa., is general manager. The concern will manufacture automobile bodies.

Frederick E. Wadsworth, manufacturer, Detroit, has acquired a factory site, 300 x 1,200 feet, in the Fairview factory district; and, it is reported, will establish there an automobile body plant. The size of the proposed plant is 240 x 260 feet, four stories. Mr. Wadsworth is connected with the Michigan Steel Boat Co., the Detroit Engine Works and other companies.

Clement Studebaker, Jr., G. M. Studebaker and C. A. Carlisle, of the Studebaker Corporation, South Bend, Ind., have joined the International Traders, Ltd. G. B. Hanford, general manager of the association, stated that the organization is in a general import and export business and that the recent addition of the Studebaker members did not presage any connection with Studebaker automobile business.

A contract aggregating \$70,000 for motor castings to be delivered at the Detroit plant of the Continental Motor Mfg. Co., has been received by the Lakey Foundry & Machine Co., Muskegon, Mich. The castings will be used in the manufacture of the 1916 Viele six-cylinder engine, the order for which was recently placed with the Continental Co. It is estimated that about 675 tons of metal will be used to fill this order.

The H. G. Burford Co., Fremont, O., has been organized to take over the Lauth-Juergens Motor Truck Co., of that city. At the head of the company is H. G. Burford, president and managing director of the H. G. Burford Co., Ltd., London, England, a prominent motor vehicle company. The other officers are J. W. Worst, vice-president; John M. Sherman, secretary, and R. J. Christy, treasurer. It has been incorporated with a capital stock of \$250,000. The plant has a large number of orders on hand for motor trucks, and it is probable that its capacity will be increased.

FIRES

The wagon and automobile paint shop of Kempf & Kopp, Louisville, Ky., was destroyed by fire May 17.

The plant of the Monarch Carriage Goods Co., Cincinnati, O., suffered a loss of about \$1,000 by fire on May 29.

Spontaneous combustion caused a fire in the carriage shop of George Clark, Buffalo, N. Y., May 29. The damage was estimated at \$1,000.

TIRE TRADE NEWS

The Mansfield (O.) Tire & Rubber Co. will shortly begin the erection of a four-story and basement addition to its plant at Mansfield, O.; this new structure to be 100 x 41 feet.

The East Palestine Rubber Co., of East Palestine, O., is putting an additional story on its factory, which will enable the company to triple its present capacity in tires and tubes.

An addition to the Falls Rubber Co., at Akron, O., will be

completed early in September. It will be 80 x 200 feet, three stories high. This company is making a tire with black thread.

The Ajax-Grieb Rubber Co., Trenton, N. J., is making preparations for the erection of a small one-story addition, 28 x 88 feet, to its factory, for which work bids have recently been asked.

According to unofficial reports, Akron's three largest rubber companies, the Goodrich, Goodyear and Firestone, are paying more than \$400,000 to employees weekly. The figures represent an increase of more than 20 per cent. over the same period of one year ago.

The Republic Rubber Co., Youngstown, O., states that May was one of the biggest months in the plant's history. Some departments are on double shift. The truck tire department is working overtime on a big foreign order. The automobile tire department turned out 50 per cent. more tires in May this year than in May, 1914.

At a recent meeting of stockholders of the Kelly-Springfield Tire Co., held at Jersey City, a resolution was passed authorizing the establishment of a fund—to the amount of 10 per cent. of the yearly net profits in excess of \$1,000,000—to be distributed among officers and employees of the company, according to a plan not yet decided upon.

Work is being rushed on the plant of the Marathon Tire & Rubber Co., at Cuyahoga Falls, O., which it is hoped to have ready for occupancy by the middle of July. The building when completed will be 300 x 196 feet, four stories high, with basement, and will cost in the neighborhood of \$100,000. It is being erected in three sections, two of which are well under way.

The Victor Rubber Co., Springfield, O., will erect another building to be two stories, 30 x 108 feet. It will be erected on the ground between the two wings of the main factory building. The addition will be much like the one which was completed a few weeks ago. A mileage capacity test is now being made of the new pneumatic tire made by this concern. An automobile has been equipped with a set of these tires and will be run 300 miles a day while they last.

The Akron Tire Co., Inc., formed in 1911 with a capital stock of \$5,000 to manufacture rubber goods, has increased its capitalization to \$300,000, and has gone into the manufacture of rubber tires in a \$105,000 factory at Long Island City, N. Y., completed early in 1914, and which has a capacity of about 200 tires per day. These tires are made under the brand "Akron," and are distributed under a guarantee of 3,500 miles service. The company's main offices and distributing headquarters are at 1612 Broadway, New York.

The Ajax-Grieb Rubber Co., of Trenton, N. J., has successfully defended the suit brought against it by the Goodyear Tire & Rubber Co., of Akron, O., for infringement of patent on a collapsible tire core, decision having been rendered in favor of the former company. The patent on which infringement was claimed was one issued in 1907 to Will C. State and assigned by him to the Goodyear company, but evidence, in the form of drawings and testimony, brought out the fact that collapsible cores, built by The John E. Thropp's Sons Co., had been in use by the defendant company as early as 1903.

Paul E. Werner, for many years identified with the printing and publishing industry, is preparing to enter the rubber trade. He is now working on plans for the organization of a \$1,000,000 rubber company for the manufacture of tires and other rubber goods. Although the location of the new plant has not been decided upon, it is reported that it will be located in a Kansas city. It is understood that the financing has been practically completed, and that the company will be incorporated soon. Mr. Werner is more than 65 years of age, and for about 40 years was at the head of one of the world's largest printing and publishing concerns. He retired from the New Werner Co., now the Superior Printing Co., about two years ago.—*India Rubber World.*

PERSONAL

J. R. Van Cleve, of Kansas City, has been appointed sales manager of the Durant-Dort Carriage Co., of Flint, Mich., succeeding John Mansfield, who is now general manager of the company. Mr. Van Cleve was formerly with the John Deere Plow Co., at Kansas City.

N. J. Riley, assistant treasurer of the Studebaker Corporation, South Bend, Ind., has resigned, so as to retire from active business permanently. Riley has been an officer of the company for more than 20 years.

Harry O. Cook, formerly trimmer foreman of the Moon Motor Car Co., is now associated with the Allen Motor Car Co., Fostoria, O., in a similar capacity.

W. H. Roninger is at Excelsior Springs, Mo., where he will remain for a while in an endeavor to get rid of a recurrence of his old trouble, neuritis.

O. C. Root, probably the oldest wagon salesman so far as length of service is concerned, has resigned his position with the Kentucky Wagon Mfg. Co., of Louisville, Ky., to accept one with the Owensboro Wagon Co., of Owensboro, Ky. He will represent the Owensboro company in Georgia and Florida.

PAIGE TO DOUBLE PRODUCTION

For the purpose of doubling its production the Paige-Detroit Motor Car Co. will begin the erection of an addition to its plant in Detroit, Mich., to consist of a three-story building 60 feet wide and 500 feet long. This will make it possible to build 150 cars a day or 70 more than the present daily output. The company intends to make 15,000 cars next season.

Considerable new machinery will be installed and the total expense will be \$275,000 or more.

Production methods will be improved and one of the features when the new addition is completed will be the installation of a mechanical conveyor.

By this system the integral parts of the car are placed on a moving platform of the endless chain type and part by part is added as the embryo car moves along from one group of workers to another. Thus the rear axle, which was the beginning of the car, will have become a complete car by the time it has reached the end of the conveyor.

RAPID SALE OF COLUMBUS BUGGY CO. ASSETS

There was an attendance of 839 persons at the sale of the assets of the New Columbus (O.) Buggy Co. held May 12 and 13. The 54 new electric and gasoline motor cars sold, one at a time, in 95 minutes, at an average price of \$979. The 1,900 lots, constituting the entire sale, were disposed of in ten hours.

All of the materials on hand and equipment, with the exception of the patterns for the making of parts, were disposed of also. The company retained the patterns and will continue to furnish parts. This business will be under the management of L. M. Browne. The buggy business was sold to A. Webber, of Louisville, Ky., who will move it to that city.

The capital stock of the New Columbus Buggy Co. has been reduced from \$500,000 to \$50,000.

TRUSTEE NAMED FOR McINTYRE

At a meeting of the creditors of William H. McIntyre, head of the McIntyre automobile works, at Auburn, Ind., held in the office of S. A. Wood, referee in bankruptcy, Willis Rhoades, of Auburn, was named trustee. Judge Wood also appointed Hugh Culbertson, Mike Boland and W. C. McNabb to appraise the property of Mr. McIntyre. They will have nothing to do with the automobile works.

OBITUARY

Joseph Byerly, 78, founder of the Byerly Carriage Co., Sharpsville, Pa., died May 26, following a lingering illness.

Henry F. Carey, 56, died at the family home, 142 Elm street, Amesbury, Mass., May 1. Mr. Carey was born at Seabrook, N. H. His father dying when he was seven years of age, his mother removed to Amesbury and took up her residence there with her brother. Young Carey was educated in the public schools of the town, and early entered the carriage business as a gear maker, working up to a foremanship in that department in the factory of R. F. Briggs, where he remained until 1887. At that time the firm was reorganized, becoming the Briggs Carriage Co., and Mr. Carey was made treasurer of the company and placed in charge of the office business, which position he held until the time of his death. He assisted in the organization of the Amesbury Co-operative Bank, and was made assistant secretary. About 12 years ago he was promoted to the secretaryship. His wife survives him.

Andrew Heim, 53, carriage and wagon builder at Marinette, Wis., died June 7 after a year and a half's illness.

Henry Heinritz, 81, for many years in the wagon manufacturing business at Green Bay, Wis., died June 5, due to a general breakdown brought on by old age. He retired from business a number of years ago. He is survived by his wife and three sons.

William A. Kettenring, 54, a prominent citizen of Defiance, O., and secretary of the Defiance Machine Works, died suddenly May 1 at the Flower Hospital at Toledo. Death followed an accident in which Mr. Kettenring fell down the stairs at his home, breaking his arm. He was taken to Toledo and had been a patient at the hospital for a few days. He left two sons to mourn his loss. His wife died some years ago. Mr. Kettenring was a brother-in-law of former Congressman T. T. Ansberry. He was a prominent Mason. The Defiance Machine Works, which was established many years ago, had been in the Kettenring family since its inception. The concern makes all sorts of wood-working machinery and does a large export business.

Dexter T. Pierce, 75, a veteran of the civil war and proprietor of the carriage business on Wickenden street, Providence, R. I., for 50 years, died at his home, 155 Governor street, in that city on May 14. He was born in Massachusetts, and went to Providence when he was 18 years of age. At the outbreak of the civil war he enlisted as a private in the First Regiment, Rhode Island Light Artillery, the first company that went out of Rhode Island, and enlisted for three years' service. At the conclusion of the war, Mr. Pierce returned to Providence, and started a carriage business, which he conducted continuously for 50 years in the same location.

John F. Quindry, 73, died May 2. He was born in Paris, France, and a resident of Princeton, Ind., since 1869. Mr. Quindry was for many years engaged in business as a carriage manufacturer. He leaves a widow, one son and two daughters.

John W. Summers, 81, retired carriage manufacturer and builder, died May 24, at Alexandria, Va. He is survived by three sons. He had been in business for half a century, and recently retired.

Zenas Thompson, 79 years of age, passed away at his home in Portland, Me., on May 23. Mr. Thompson had been a resident of Portland for the past 60 years. Most of his life had been spent in the carriage business. He was president of one of the best known carriage building concerns in the New England states. He served his apprenticeship with James Kimball, then a widely known carriage manufacturer. After learning the business, Mr. Thompson went into partnership with Mr. Kimball, but a few years later went into business for himself. He is survived by a son and three daughters.

WANTS

Help and situation wanted advertisements, 1 cent a word; all other advertisements in this department, 5 cents a word; initials and figures count as words. Minimum price, 30 cents for each advertisement.

PATENTS

Patents—H. W. T. Jenner, patent attorney and mechanical expert, 606 F St., Washington, D. C. Established 1883. I make a free examination and report if a patent can be had and exactly what it will cost. Send for circular.

FOR SALE

For Sale—Large quantity of ¼ in. Dia. Standard Axle Clips, all lengths from 1½ in. to 3½ in. inclusive. All in first class shape, but on account of being obsolete, can make very attractive prices. If interested, send for samples. Stewart-Warner Speedometer Corporation, Purchasing Dept., 1826 Diversey Bl., Chicago, Ill.

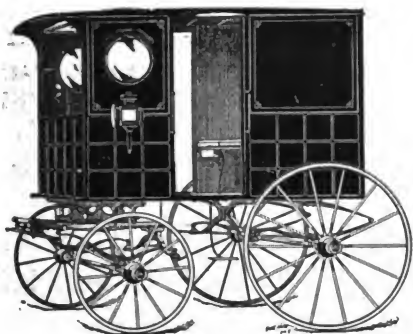
Twenty cars Hickory Axles, Rim Strips, Spoke and Evener Stock etc., Oak Poles, Reaches, Bolsters, Felloes, Gearing, etc. Twenty cars Wagon Box Boards and Panel Stock. Geo. T. Houston & Co., Railway Exchange Building, Chicago.

SITUATIONS WANTED

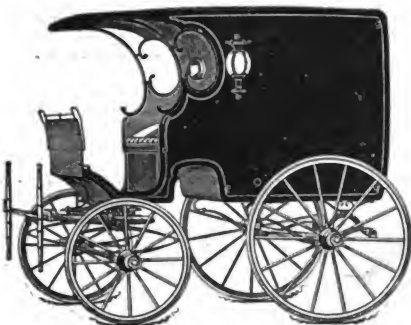
Wanted—Position by an all-round Painter, first class striper and finisher, capable of taking work from start to finish. At present finisher on automobiles. Will go to country shop; strictly temperate; 48 years of age. Address Wm. S. Green, painter, General Delivery, Philadelphia, Pa.

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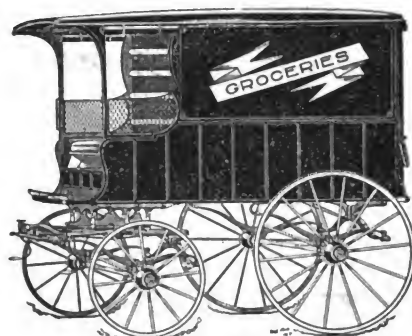
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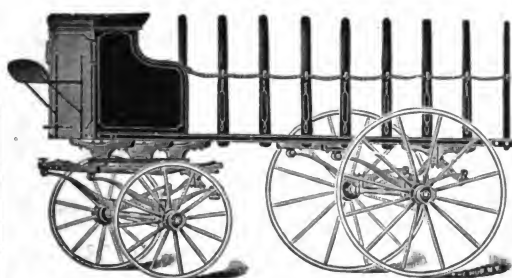
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No. 111.—Altman Wagon.



No. 113.—Grocery Wagon.



No. 122.—Flour Truck.

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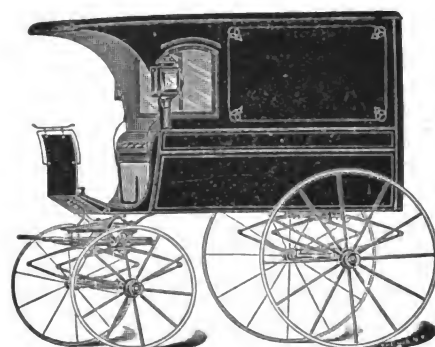
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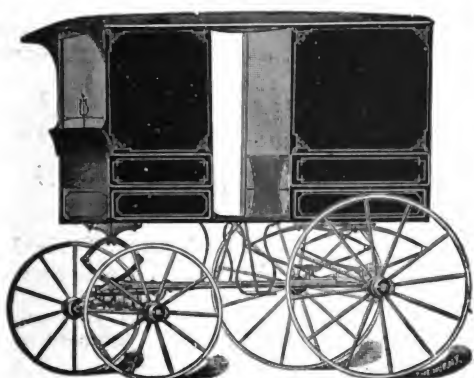
containing nearly 200 illustrations of carriages, wagons, sleighs, and miscellaneous cuts will be sent upon application.

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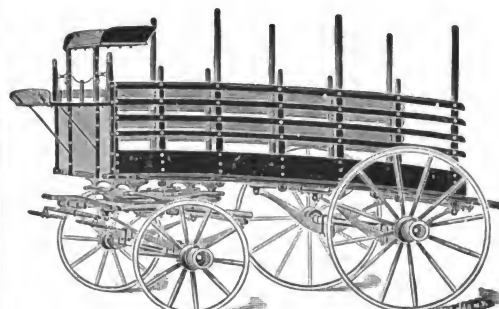
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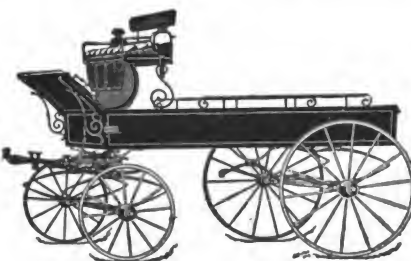
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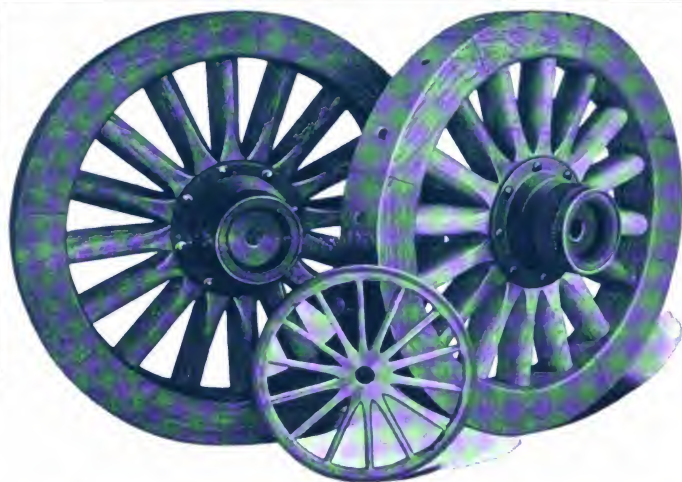
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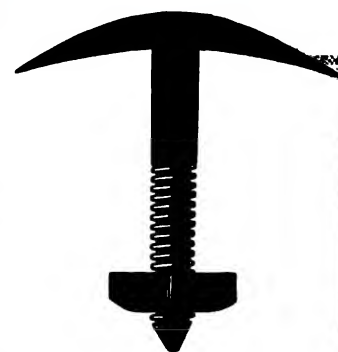
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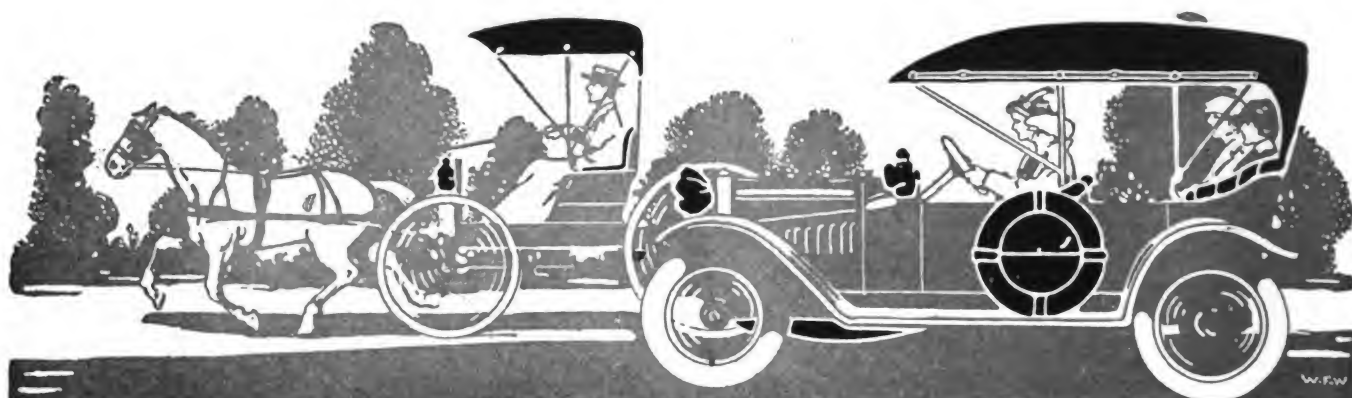
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Vol. LVII

JULY, 1915

No. 4

THE TRADE NEWS PUBLISHING CO. OF N. Y. Publishers of THE HUB

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DIRECTORY (annual).....per copy, \$5.00

THE HUB is published monthly in the interest of employers and workmen connected with the manufacture of Carriages, Wagons, Sleighs, Automobiles and the Accessory trades, and also in the interest of Dealers.

Subscription price for the United States, Mexico, Cuba, Porto Rico, Guam the Philippines, and the Hawaiian Islands, \$2.00, Canada, \$2.50, payable strictly in advance. Single copies, 25 cents. Remittances at risk of subscriber, unless by registered letter, or by draft, check, express or post-office order, payable to the order of THE TRADE NEWS PUBLISHING CO.

For advertising rates, apply to the Publishers. Advertisements must be acceptable in every respect. Copy for new advertisements must be received by the 25th of the preceding month, and requests to alter or discontinue advertisements must be received before the 12th day of the preceding month to insure attention in the following number. All communications must be accompanied by the full name and address of writer.

FOREIGN REPRESENTATIVES:

FRANCE—L. Dupont, publisher of *Le Guide des Carrossiers*, 78 Rue Boissiere, Paris. Subscription price, 15 francs, postpaid.

GERMANY—Gustave Miesen, Bohn & Rh. Subscription price, 12 marks, postpaid.

ENGLAND—Thomas Mattison, "Floriana," Hillside avenue, Bitterne Park, Southampton. Subscription price, 12 shillings, postpaid.

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Vocational Training

The recent decision of a well known manufacturer in the automobile industry to discontinue its course of mechanical education and training for young men, adopted as a means of creating a field wherefrom to draw its future employes, may come as a surprise to some, particularly those who look upon technical schools as a most important factor in the accomplishment of large and successful businesses.

The manufacturer referred to spent upwards of \$17,000 in four years of effort to produce competent and properly educated mechanics for particular work. It is worthy of comment that this undertaking was abandoned principally because of the advance of vocational education in the public schools system.

Much has appeared recently regarding the absence of some form of apprenticeship for young men and boys. It would prove of interest to investigate the extent of vocational training throughout the country. From the first class in cooking, or domestic science, this branch of educational work has grown to great proportions in some localities.

Various trade interests have combined to secure the successful financing and conduct of technical schools devoted to the interests represented. Among others the Technical School for Carriage Draftsmen and Mechanics stands first in the carriage and allied lines.

The New York school, established many years ago by the C. B. N. A., has proved so satisfactory that there have been established during the past year or two, similar schools in Philadelphia, St. Louis and Cincinnati.

Now there are also public schools which have their various departments of vocational instruction, including complete wood-working outfits, machine shops, forges, etc., etc. This form of instruction will no doubt ultimately produce a supply of well trained mechanics and others fitted to take the places of those who might have secured their training in what are sometimes called "company schools." All this leads to the conclusion that, while one firm has given up the technical education of prospective employes, and others may do likewise, so long as we have an increase of vocational training schools we can be assured of a satisfactory future supply of practical and efficient workmen for the various industries demanding them.

New Jersey Road Law

One of the paramount features of New Jersey's vehicle law, which went into effect on May 6, is the legal definition of who has the right of way at intersecting streets not guarded by traffic officers. Under the new law the right is given to the driver of the vehicle on the right at such intersections.

New Jersey is declared to be the first state to adopt and put in effect a complete state-wide law regulating all classes of vehicles which use the roads of the state, whether automobiles, horse-drawn or otherwise propelled wagons. This law defines the rights of all who use the road, from the pedestrian up to the powerful automobile. It supersedes all ordinances of any municipality.

It is said that many other states will use the New Jersey law as a model in framing similar statutes. State regulation of traffic is bound to come, and now that a start has been made, it will probably make rapid strides the country over.

C. B. N. A. Committee Wants Information

The Committee on Statistics for the Carriage Builders' National Association is anxious to secure as complete data as possible as to the number of buggies and car-

riages (spring work) made from June 30, 1914, to July 1, 1915.

The committee has sent to every carriage builder in the United States a letter asking for certain information as to production, etc. It is hoped the trade will respond in a manner equally as satisfying as in the previous year.

AN APPRECIATION

No. 20 West 44th St., New York, June 30th, 1915.

Editor, *The Hub*: I have been reading in the vehicle trade journals, of the recent passing away of Zenas Thompson, who was at one time the leading builder of fine carriages and sleighs in the state of Maine if not in New England. These press notices state that Mr. Thompson was a prominent man in many ways side from his business, which is all true. There was still another side to his character which appealed strongly to those in his employ and which made him beloved by his men. I refer to his keen personal interest in his employes, every one of whom was his friend. It was my good fortune to be employed by Mr. Thompson in years past and therefore I can speak with knowledge on the subject.

If Mr. Thompson made a verbal agreement with one of his workmen as to the performance of certain work and the remuneration for the same, the workman was absolutely certain that the agreement was as binding on Mr. Thompson's part as though an elaborately written contract had been drawn and signed by witnesses. Mr. Thompson was a fine workman and could therefore better appreciate worthy work done by others. He gave generous prices to his workmen, only requiring their best work. He was ever ready with kindly sympathy and unobtrusive help when needed. These things endeared him to his working force, and every man was anxious to do his best. In recent years when in Maine, it has been the privilege of the writer to call occasionally on Mr. Thompson, and his absence is a keen personal loss to me. Yes, a great-hearted, good man has gone, but to those who knew him, the inspiration which his life afforded will remain a precious heritage.

ANDREW F. JOHNSON,

Instructor,

Technical School for Carriage Draftsmen and Mechanics.

MEMORIAL SERVICE FOR D. M. PARRY

At 12 m., on Tuesday, May 25, a memorial service was held in honor of the late David M. Parry, former president of the National Association of Manufacturers. The eulogy of Rev. S. Edward Young, pastor of the Bedford Presbyterian Church, Brooklyn, N. Y., who conducted the service, follows:

"What doth the Lord require of thee, but to do justly and to love mercy and to walk humbly with thy God?"—Micah.

"After he had served his own generation by the will of God, fell on sleep, and was laid unto his fathers."—St. Paul.

We have wreathed before us in immortelles the likeness of our promoted friend. Never did a man's face tell his life story more faithfully than did the face of David McLean Parry. That firm-set mouth, that knew how to smile, but told of resolution that never could be daunted and never would be surrendered; that mouth that always seemed to say, "I am ready for a frolic or for a fight," and in no measure misannounced the character that was behind it; and those clear penetrating eyes, with their upward glance, which spoke of a hope that was unconquerable and a cheerfulness that was perennial. Every man who looked into them steadily came under their spell. It was a note of his nature that was always in evidence. He never reached a time when he did not have hope enough to go on in what he thought was right, and that open countenance showed an utter absence of hypocrisy, which was always so well spoken in his very face. What he thought he could not help but say. What he was he could not help but let shine out. Anybody seeking for

a foe might be able to see Captain Parry opinionated, or extreme, or quick of temper, or over-persistent; but nobody could charge him with lack of candor or of courage or of activity.

I had learned to love in my friend the few wrinkles that had begun to gather in his face. Anyone who understood his life readily deciphered the hieroglyphics of those wrinkles, that told of the long and successful struggle of that boy whose career started on a farm just outside of Pittsburgh, and included as much of variety, I suppose, as that of any members of this association. Farmer, reporter, lawyer, manufacturer, financier, politician, with no interest for himself in politics; maker we might say of men in great positions, with a genius for acquaintance-making with world leaders. Many of these world men or power were his personal friends. He had a sort of affinity for minds like these and they for him, and he gave just as much as he got, too, when he met them and in his association with them. A leader in education, president of the National Educational Association, a writer who had a pen that was trenchant and commanded the almost unparalleled interest of the readers along the lines about which he wrote—this was our friend in his activities.

In 1903, by his address in New Orleans, Captain Parry became the champion, as no other man was, of the open shop, and was the chief exponent of the proposition that every man shall be independent to sell his own labor in whatever market he chooses.

When the world war, now shaking the planet, is over, this contest about labor throughout the nations will no doubt still be left. When that contest is fought out, it will no doubt be fought out—however it may be decided—along the lines outlined by our friend. He has outlined the issue, and however it may terminate, that is unquestionably the issue as he has formulated it, and there could be no greater calamity to the race, nothing more to be dreaded—more than the present war—than that a contest between the employer and employed should be let loose in all its fury upon mankind. God grant that it never may be, but that this contest shall be fought out in wisdom and brotherliness and fairness and patience on both sides; and when it shall be so fought out, the name and the personality we are recalling in this hour will stand before the world as one of the rugged, heroic pioneers who, though men might differ as to their opinions concerning his opinion, none who knew him would ever differ as to his absolute integrity, the probity of his private life, the sweetness and tenacity of his friendship, and the indomitable will that pervaded all his career.

We are glad that he was not left to suffer very long with this last malady of his. He had gone abroad in behalf of a department of this association, and came back with the death-wound of disease. How he got it we need not try to analyze. It baffled the ship's surgeon. But, attacked by the disease that was to take him away, he was still full of activity, still had his noble dreams for this association and for the business of this country, and lingered a little. He was a pure, unsullied, brave soldier among the captains of industry of this land, and we trust to meet him by and by where the fruits of all our labors will be given in unstinted measure by the God who kindly cares for all.

GRANT WRIGHT GONE DRY?

Grant Wright, in the *Eastern Dealer*, has the following to say under the heading, "Booze and Business":

Once we heard of a dealer who being asked to take a drink told the salesman that he had a bottle at home, but would take the 15 cents that the drink would cost at the bar.

This dealer was classed as an "odd Dick" for the suggestion, but was he after all?

Every drink, every cigar, and some drinks and cigars never bought, goes right in the expense account, and the dealer pays his share in the end.

This, dear reader, starts off like a temperance lecture, and it is, for everyone seems to be doing it, so why not the editor.

Let us say in passing that the editor writes, not as the day after, or from re-morse, but we have joined the army who believe that the two b's—Booze and Business—never will join in the work of filling the hive with honey.

We can all remember the days when the salesman always "bought," and was classed as a cheap skate if he did not. Today the salesman who suggests a drink suffers in the estimation of the man he proffers it to.

Booze and business have been divorced, and there will never be a remarriage.

This has not come as the result of any crusade, but gradually it has crept in the lives of business men that no success can come from the attempt to mix the two.

Just a few years back one had to dodge booze at every fair, but now it is a hunt and your tongue can hang out a foot before you will hit the right shot.

Very recently a convention was considered a place to get tight, but today men gather at these affairs without a thought of a drink fest.

No wonder we are all for it. No wonder we itch for a chance to vote local option. The future is sure to be without booze.

If you must drink let your wife buy a gallon for about \$2. This contains 69 drinks. Pay her ten cents every time you want a nip, and you will keep the profits at home, and when you die she will have enough to make a good showing that will attract a decent man.

Remember, this is written in a sober moment. We are against booze just as we are for business.

CINCINNATI CARRIAGE MAKERS' OUTING

On Saturday, June 19, the Cincinnati Carriage Makers' Club held its 19th annual outing. The steamer Kentucky carried the club to New Richmond, O., where the events of the day were of a lively and interesting character. The meeting was marked by an unusually large attendance and an abundance of real enthusiasm. The river trip served as occasion for a cafe luncheon, accompanied by vocal and instrumental music. At the New Richmond grounds the club enjoyed an elaborate dinner.

There were on board the steamer Kentucky when she left Cincinnati at 10 a. m., 95 members, 24 members' guests and five guests of the club. The steamboat trip was enjoyed to the full.

After the dinner, which was served promptly on arrival at New Richmond at 1:30 p. m., President Perrine dispensed with all business, except to announce that the Board of Governors passed on the following new members who were elected to membership: H. R. Daniels, of the Pinneo & Daniels Co., Dayton, O., presented by Chas. Egolf and I. O. Bauer; Walter R. Scott, of The L. C. Chase & Co., Boston, Mass., presented by Clem Perrine; Albert W. Killin, of The Vulcan Supply Co., Cincinnati, O., presented by Milt Wieman; J. W. Allen, of The Owensboro Wheel Co., Owensboro, Ky., presented by Harry Roettinger.

Before the baseball game and athletic events began, Edward Sendelbach delivered an address in which he showed that the giant strides of the automobile industry had not affected the vehicle with shafts.

A tug of war, relay races, potato race, 100-yard dash, 50-yard dash, fat men's race, thin men's race, golf putting, pie-eating contest, watermelon-eating contest, and pinochle championship were some of the athletic events. The accessory team and manufacturers' team played baseball. The game was won by the carriage team, the score, 15 to 8. It was a pitcher's battle between Clem Davis and Irvin Bauer. Clem Davis pitched a wonderful game of ball, but unfortunately the errors behind him lost him his game.

The various results of the contests were as follows:

Tug of War—Won by the Accessories team.

Relay Race—Won by the Manufacturers.

Potato Race—Chas. Egolf.

100-yard Dash—D. N. Burchard.

50-yard Dash—D. N. Burchard.

Fat Men's Race—J. J. Schiff.

Thin Men's Race—W. B. Timberlake.

Golf Putting —Howard Cox.

Walter Brunsmann, chairman of the Bean Guessing Contest, announced the following winners:

Ed. C. Sendelbach, first prize of..... \$5.00

W. A. Sayers, second prize of..... 3.00

A. P. Herrlinger, third prize of..... 2.00

Jos. Wallenstein—The booby prize.

The correct number of beans in the jar was 3 263.

Mr. Sendelbach guessed..... 3,261

Mr. Sayers guessed..... 3,251

Mr. Herrlinger guessed..... 3,241

Jos. Wallenstein guessed..... 75,550

Mr. Wallenstein also received his prize, but we will not mention same here.

At 5:30 the boat started up the river a few miles. The scenery was beautiful, and cannot be surpassed any place.

A hot lunch was served at 6 o'clock, which the members seemed to enjoy. The boat landed at the Cincinnati dock at about 9 o'clock, closing one of the best outings this club has had for a long time, thanks to the energetic efforts of the Entertainment Committee.

Everyone who attended the outing reported a good time, and much credit is due the entertainment committee, composed of the following: Harry Roettinger, Jos. Wallenstein, P. P. Hunter, C. F. Egolf and G. W. Huston.

The officers of the Carriage Makers' Club are as follows: Clem Perrine, president; Chas. A. Fisher, first vice-president; George W. Huston, second vice-president; Emil E. Hess, treasurer, and C. J. Rennekamp, secretary.

NO SHORTAGE OF AUTO LEATHER

In denial of articles that have appeared in the public press regarding the scarcity of leather for automobile work, James B. Reilly, secretary of the Patent and Enamelled Leather Manufacturers' Association, has the following to say:

The impression has been cast and sent broadcast that there is a scarcity of good auto leather. The actual and undisputable fact is that there is absolutely no scarcity of either good, bad or indifferent leather, never was and there is not likely to be any either. Any one stating otherwise is either badly informed or deliberately makes a misstatement of truth. This from those who manufacture auto leather and know the facts.

The statement that there is a scarcity of good leather is a distorted one. In a certain sense the statement is true, but only so in the sense that the scarcity is due to the fact that no leather can be had today at 1910 to 1914 prices. Other than this the markets are well supplied at 1915 prices and in fact the supply exceeds the demand, since the tanneries catering to the wants of the auto trade are averaging only 50 per cent. capacity. Demand for leather at one price and supply of same at a higher price is the cause of the so-called scarcity. Any auto manufacturer so desiring can readily obtain his requirements with little or no difficulty. This state of facts can be readily ascertained by any one desiring to reach them.

It is also true that some auto manufacturers cannot actually obtain leather, but this is due to their own faults, because they will not place orders for enough in advance to warrant delivery as wanted. Up to a year or so ago it was the general practice among the auto trade to place orders every six months for the next six months supply. This practice is still in vogue among the manufacturers of medium and higher grade cars who must have leather and assurance of supply. The reason for this is because it requires from two to three months time to produce a hide of leather from the raw hide state to that of the finished state ready for the upholsterer, and orders must be placed ahead to assure delivery as required. Manufacturers who want leather and expect delivery upon short notice, of course, cannot get it, because it is not in existence to be had. This, of course, does not indicate any scarcity, but some short sighted automobile manufacturers chose to call such a peculiar

state of affairs, simply because they do not want leather at present market prices and prefer to use cloth upholstery at a lower cost, giving a plausible reason for so doing.

Let this fact be known: That automobile upholstery leather is never made up for stock and is always manufactured upon specifications from the purchaser only and ample time must be granted for the filling of orders, otherwise there will be no leather to be had for immediate delivery and hence a temporary scarcity. As for such a state of affairs as a real scarcity of automobile leather there is none.

DISCOVERS RUBBER SUBSTITUTE

Dr. Lyman A. Noble, electro-therapist, of 810 Schofield Bldg., Cleveland, O., claims to have discovered a substitute, combining all the qualities of natural rubber. He states that the chief ingredient of his product is coal tar.

Mr. Noble has been experimenting for nearly a year. His first experiments failed because the resulting product was greatly lacking in resiliency. This he found was solely a matter of process, and the use of a high frequency, high voltage electric current has eliminated the difficulties. By evaporating the liquid combination of ingredients and submitting them to a high frequency current for an extended time, 6 hours, the result was attained.

From 200,000 to 500,000 volts of electricity of high frequency was necessary to produce the rubber. The various ingredients are mixed, by a secret formula, into a liquid which, under heat, is evaporated down to one-quarter of its original mass. When it has reached a consistency of a thick syrup, the mass is placed in a metal retort and connected with a high frequency electrical machine. The retort forms one pole and the other pole is suspended in the liquid. The current is turned on and after six hours the retort contains a black, spongy substance with all the qualities, Dr. Noble claims, of natural rubber.

The inventor claims that with the artificial rubber the cost of a 37 x 5 inch tire will not cost more than \$15 a tire, or \$60 for a set of four.

He stated that a company is being organized to manufacture his product on a large scale, and a plant will be built in Cleveland.

EXPOSITION MEDALS CANNOT BE PHOTOGRAPHED

According to dispatches from San Francisco, the exposition officials are in receipt of a letter from the Director of Mints, Washington, D. C., in which it is stated that the Solicitor General and officers in the secret service hold that the making of photographs of medals and diplomas awarded to exhibitors at the Panama-Pacific Exposition would come under the law which prohibits the reproduction by photograph or otherwise of United States coins and securities. It appears that the medals and diplomas for the exposition were struck off and printed in the United States mints and the department of engraving and printing. If reproduction of these proofs of awards is to be allowed, Congress, it is stated, will need to pass a law exempting such medals and diplomas under the law.

NEW ZEALAND ASSOCIATION CHANGES TITLE

At the annual meeting of the Carriage Builders', Wheelwrights' and Motor Car Builders' National Association of New Zealand, the name of the organization was changed and it will henceforth be known as the New Zealand Vehicle Trades' Industrial Association.

The new officers are: President, Geo. Dash, Waimate; vice-president, North Island, H. A. Whittaker, Hamilton; South Island, W. Boon, Christchurch; Hon. secretary and treasurer, E. C. Harvie, Dunedin.

The association's next convention will be held at Palmerston North.

INCREASING DEMAND FOR RUBBER-TIRED BUGGIES

The demand for rubber carriage tires continues to grow, although this fact may not accord with the common impression. While the automobile has been coming forward so rapidly, the assumption that the carriage has been retreating at the same rate of speed is a fallacious one.

Some there may be who have watched the wonderful advance of the automobile, and who have viewed with sympathetic eye what they thought was the "decline of the horse-drawn vehicle."

The truth is that there has been a continuous demand for rubber-tired buggies, and the outlook for the future is indeed encouraging. It will be a long time, says the Horse Lover, before the carriage is pushed off the road. Road improvement, while it has accelerated the advancement of the motor car, has also stimulated the use of carriages.

The rubber-tired buggy and light carriage still have their advantages, and will continue to be popular, no matter how many automobiles are made, nor how cheap they may become.

EFFICIENT TYPES OF THE "JITNEY"

Through the courtesy of The Jitney Bus, the official organ of the International Jitney Association, published in New York City, we are this month showing in our fashion pages some of the latest types of buses that are being operated in various sections as "Jitneys."

The gas electric bus shown on page 7 is built by the Gas Electric Motor Bus Corporation, and is of the double deck side entrance design. A gasoline engine under the hood running constantly at uniform speed is coupled directly to an electric generator, producing the current supplied to electric motors which drive the rear wheels by means of noiseless worm gears. This eliminates all gear shifts and effects a saving in noise and wear and tear. It also leaves the driver with nothing to do in connection with the power except to operate a foot button which regulates it from zero to the full power of the engine giving a speed of from one-eighth mile per hour to the maximum. The company makes single deck one man buses, seating from 18 to 32 passengers, also.

On the same page is a view of the rear end of one of New York City's new busses, which are creating much interest in that city.

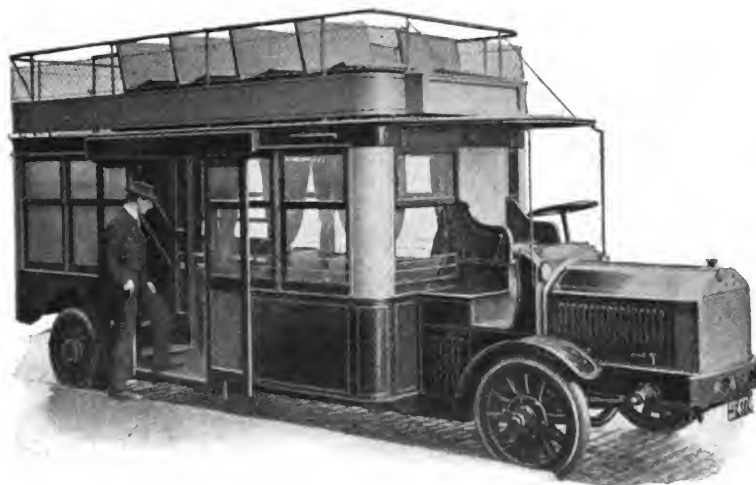
On page 8 the 26-passenger bus being turned out by the Kelly-Springfield Co. is shown. This bus is built on the standard 3½-ton chassis and a certain western city is said to have ordered 13 of them. This company builds bodies to suit individual requirements of purchasers and has already turned out several hundred busses.

On this page is also illustrated a Ford Bus; the body built by the Highland Body Co., of Cincinnati, O., which company makes a specialty of bodies for Ford cars, and, in addition to the closed type, six-passenger design shown, is also putting out an open body type with a capacity for seven persons, including the driver. In the open body design the entrance is placed at the front of the running board. It is said the open body weighs but a few pounds more than the regular Ford touring car body. It is attached to any Ford car by the use of six bolts.

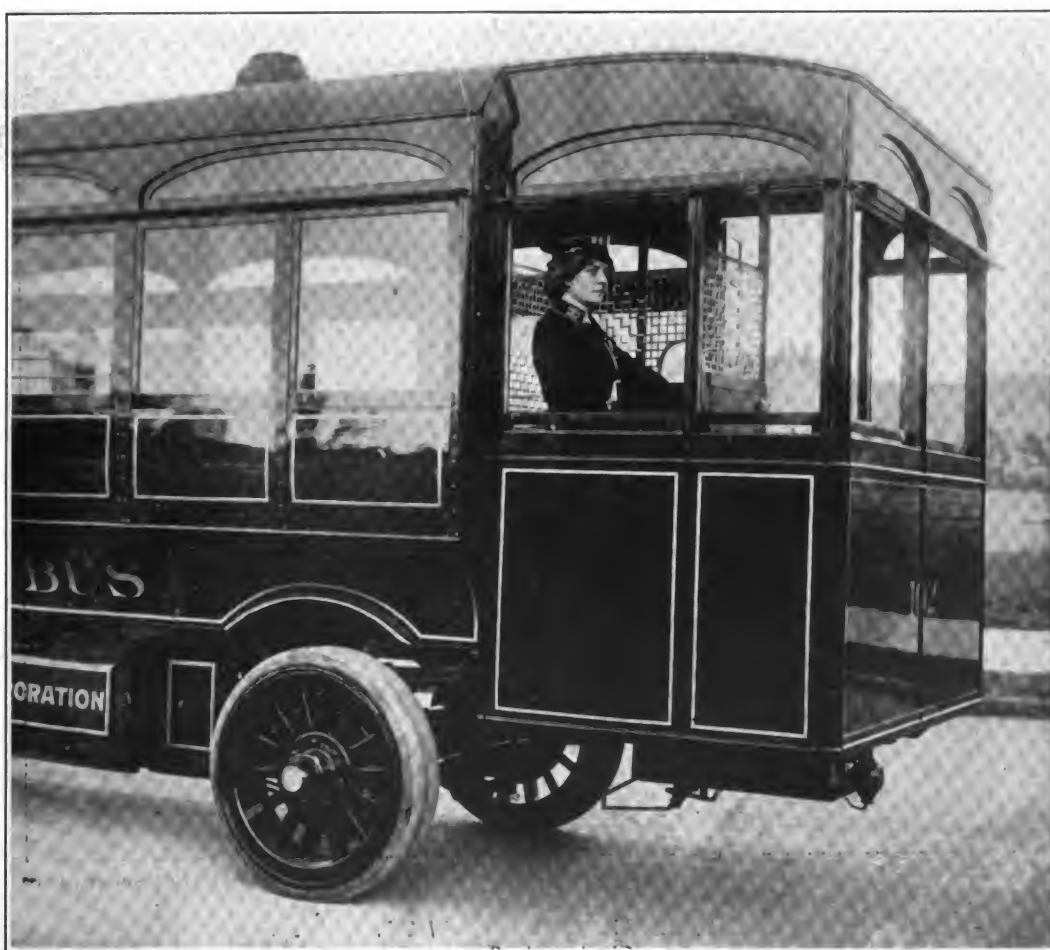
The 34-passenger White Jitney illustrated on page 9 is of the type furnished a Washington, D. C., firm in large numbers. Built on a standard chassis of the company, though lengthened to meet the requirements of the large body. The driver's seat is at the right and the entrance at his left. He collects all fares which are placed in a cash box at his right. A conductor is thus shown to be unnecessary for the successful operation of large type busses.

The Federal Motor Truck Co.'s type of bus is shown on the same page with the White Bus. The illustration shows one of a fleet in use in Albany, N. Y. They are of strong, sturdy construction and are worm driven. The Federal Co. has a complete line of busses of from 10 to 40 or 50 passenger capacity.

Types of Jitney Busses



GAS-ELECTRIC DOUBLE-DECK BUS
GAS-ELECTRIC MOTOR BUS CORP.



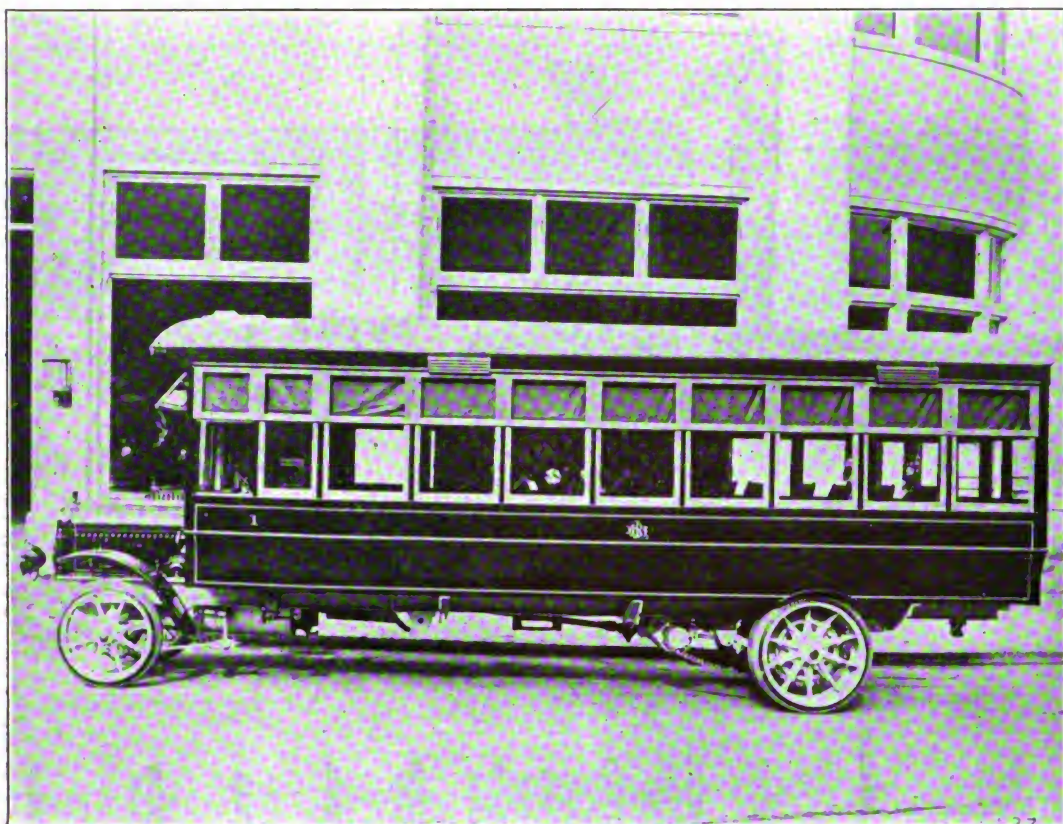
NEW YORK JITNEY BUS



KELLY-SPRINGFIELD 26 PASSENGER BUS
KELLY-SPRINGFIELD CO.
Springfield, O.



FORD BUS
HIGHLAND BODY MFG. CO.
Cincinnati, O.



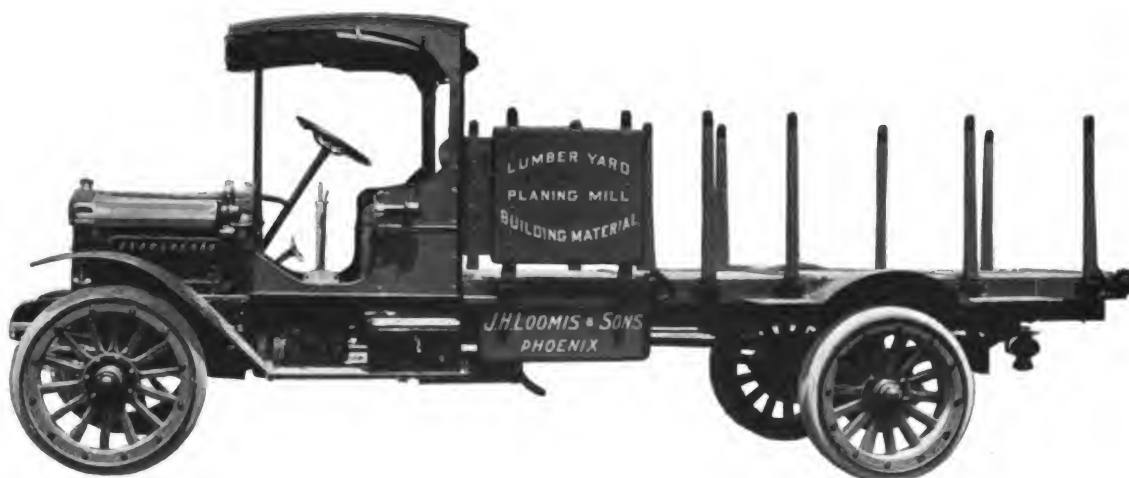
WHITE 34 PASSENGER JITNEY
THE WHITE COMPANY
Cleveland, O.



FEDERAL 3½-TON BUS
FEDERAL MOTOR TRUCK CO.
Detroit, Mich.



BROCKWAY MODEL "J" WORM DRIVE STANDARD EXPRESS BODY
 Manufactured by Brockway Motor Truck Co., Cortland, N. Y.



BROCKWAY MODEL "K" TWO-TON WORM DRIVE LUMBER TRUCK
 Manufactured by Brockway Motor Truck Co., Cortland, N. Y.



BROCKWAY MODEL "I" TWO-TON CHAIN DRIVE COAL TRUCK
 Manufactured by Brockway Motor Truck Co., Cortland, N. Y.

THE HORSE-DRAWN VEHICLE BUSINESS—ITS PRESENT CONDITION AND ITS FUTURE PROSPECTS

The pioneer manufacturers of buggies in wholesale quantities in these United States laid the foundation for one of the biggest, most far-reaching, influential and successful industries of the country. Cincinnati was the first city to go into this business on any great scale, but other cities followed, and, with characteristic American energy and pluck, they went their way to success.

The American carriage industry still exists and presents itself today a strong, vigorous, progressive and prosperous industry—old in experience, but still full of enterprise. The pessimistic and the uninformed may think the industry of making horse-drawn vehicles, such as buggies and light carriages, is a dying one and that the carriage manufacturers are a fit object for sympathy.

The subject of the decadence of the horse-drawn vehicle and the approaching elimination of the horse seems to be a favored one for sensational newspaper articles and a fitting topic to be brought into any conversation bearing upon the subject of transportation. These newspaper writers, however, and these gossip mongers are all wrong. Why, bless their poor souls, the carriage business thrives today, as it always has done on opposition. Let us state a few instances:

Vehicle Business Has Thrived on Opposition

Previous to the days of the old national roadway, built by the government of the United States, from Cumberland, Md., to St. Louis, Mo., the horse-drawn vehicle of various kinds and capacities had a monopoly of the land transportation business of the country. Then came the steam locomotive with its steel ribboned roadway. Still the horse multiplied and the carriage makers grew fat and some of them rich. Later the electric trolley car succeeded the horse, and its colleague, the interurban car came, and still we sold buggies and the carriage manufacturers and the dealers continued to prosper.

Then came the bicycle craze, and the absolute annihilation of the horse was predicted as imminent. Yet the horse, apparently with no idea of race suicide before him, multiplied at the amazing rate of 1,000,000 per year, with the result that the carriage maker took another hitch in his trousers and made more buggies.

Now, it was the turn of the automobile "to get a crack at" the buggy. Like Julius Caesar, of schoolboy fame, "it came, it saw and it conquered" a host of people. Not one-half of them had ever owned, and many of them had seldom ridden in a horse-drawn vehicle. The automobile came and spread like the locust in Egypt—everywhere. Even into those places where chattel mortgages are recorded and where the "uncle" with his three golden balls holds forth. And now the anti-carriage man holds that the horse is again annihilated and the horse-drawn vehicle relegated to the junk pile.

Automobile Has Hurt Custom Carriage Work

Everybody—manufacturers and dealers included—frankly admit that there were certain styles of carriages of the horse-drawn type of the city—the victoria, brougham, or, in other words, what is known among carriage makers as heavy work, or custom work, was greatly affected by the automobile, and

for the good reason that the purposes for which they were intended the automobile exactly fills the bill. Besides, it was more speedy, more rapid and more convenient than the same style of vehicle built to be drawn by horses.

The carriage makers freely admit these facts, yet it is perhaps not generally known that the so-called heavy vehicles never constituted more than 10 to 15 per cent. of the whole number of horse-drawn vehicles built for pleasure use, leaving another 85 per cent. of the horse-drawn vehicle industry of the country almost untouched by the automobile. Again, it is freely admitted that the advent of the extremely low-priced automobile has cut somewhat into this 85 per cent.

It was in the year 1906-1907 that the demand for buggies reached the highest tide in the history of the industry. Yet, in those years there was already an enormous demand for automobiles. In 1908 the industry suffered a decline in demand, but not as great a decline as many other industries of the same magnitude. The year 1909 was a "high peak" year with an increasing demand, but little less than 1907. In 1910 the demand for buggies would have been even greater than the record year of 1907 had it not been for the continued unfavorable weather of May and June. But even with the weather conditions experienced in the spring of that year the demand during the season was a capacity one, and the carriage industry, as a whole, was fairly well satisfied.

Taking all these facts together, the man who predicts the downfall of the horse must be an idiot. One who denies the great necessity for the automobile and the probability of its general adoption for very many purposes is surely not well informed, but the one who predicts the total annihilation of the horse and the horse vehicle is what the immortal Solomon might call a "phool."

It is not the purpose of this article to enter into anything like a prediction of the future of the automobile, but one thing seems self-evident, and that is that the supply of automobiles seems to have fairly caught up with the demand, temporarily at least, and it is not impossible that the automobile will have the same experiences in the future that the buggy has had in the past.

It is but fair to believe that should the present conditions of the country remain as they are, the buggy industry can look forward to this year and the next year and many succeeding years with renewed confidence, and with the well-founded belief that it can repeat in the future the great performances of the past.

Buggy Industry Needs More Optimism

During the past year or two business of all kinds has passed through very strenuous times. Not only in the carriage business, but in all lines of business there has been a general depression and a general curtailing. It would be surprising, indeed, if the buggy business escaped. The principal stimulant needed, both by the manufacturers of and the dealers in buggies, consists of liberal doses of optimism. A story is remembered, which was heard, we believe, in New England, of two frogs that were caught in a milk can on its way to Boston. Whether the frogs came from the cow, or by way of the farm pump, deponent saith not. However, one of the frogs was optimistic, and the other was a pessimistic frog. The pessimistic frog said, "Brother, it is all up with us. We will be drowned before we reach Boston." The optimistic frog said, "No, while there is life there is hope." When Boston was

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reached there was the poor little pessimistic frog quite dead. The optimistic frog was alive, floating around on a pat of butter that he had kicked up on his way down to the city. There is always something to be cheerful for. There is sure to be an opportunity when we seek it. That optimistic frog should be able to teach the vehicle trade a wholesome lesson.

Just now there are special reasons for optimism in the horse-drawn vehicle trade. American business men have the reputation for seeing and taking advantage of opportunities, when they are not actually making their own opportunities, and for energy, resourcefulness, initiative and disregard of precedents in making their business go, no matter what obstacles they may encounter. The tendency among United States business men is to be over bold in business, to go at opportunities whenever they present themselves; but this is a fault that has its virtues. It is the result of the readiness of American enterprise to break new ground and throw itself with characteristic energy into new undertakings when satisfied that they are sound and with a fair prospect of reward.

The door is open and the psychological moment has come for many of our manufacturers to go into foreign trade, but many of our manufacturers have to be shown this opportunity. There is a strong undercurrent of interest among many of them, but there are others who fail to realize that foreign markets are exactly like domestic markets; that they hold opportunities for the men who hunt them out, as they do the home opportunities, and conquer them when found. It is hard for some to realize that this foreign market is going to be open to American goods by the sheer force of our economic development, and that the men who go into it will have an advantage in the domestic markets over their competitors, and that foreign trade is not a haphazard chance to sell a few dollars' worth occasionally, but an honest kind of business that must be gone into with determination, careful planning and sufficient capital.

The men who have made the big successes in export business have put their minds to it with the same earnestness with which they have tackled home propositions. They have used money to build it up, taking temporary losses, and sometimes, when they saw success ahead, putting into it the same brand of energy and disregard of precedent that they have shown at home.

The responsibility imposed upon the American farmers by the war is tremendous, for this country will be called on, as never before, to help feed the nations of the world. To set the wheels of industry and commerce in motion, credit, confidence and courage are needed. All these qualities the American people have, or can acquire, and the farmers of America, realizing their special responsibility, will do what the world expects of them. While the prosperity of our farming classes is even at this time a special boast of our people, it will bear no comparison with what may be confidently predicted within the next few years.

While it is true that high-priced carriages have almost disappeared from city streets, it is equally true that farmers still use buggies. Some farmers use more of them than others, and no farmer, even though he owns the latest automobile model, would be without one or more buggies, if he had more money to spend. The prosperity that is coming his way within the next year or two will give him that money. Some of it will get into the hands of the buggy dealers, and a part of it will be passed on to the manufacturers.

Not all the country roads have been improved, nor will they be improved for many years to come. Even where road betterment has arrived the benefits accrue as much to the horse-drawn vehicle as they do to the automobile, but wherever roads have not arrived at a state of perfection, buggies are an absolute necessity. Notwithstanding that a great many farmers have been using the automobile, they have held on to the buggy too, and, with money more plentiful, there will be as big a demand for them as there ever was. The farmers' sons, especially, find that they cannot get along without a buggy. One cannot steer a Model T automobile with safety, and at the same

time keep his arm around the slender waist of the prettiest girl in the neighborhood. The buggy is one of Dan Cupid's best assistants, and every country bred young man is well aware of that fact. The farmer's wife, too, and his daughter, feel that it is absolutely impossible for a lady to look dignified, graceful or beautiful in a motor car, unless the car happens to be a closed one, and then the enclosure which protects the lady's dignity and beauty at the same time hides those qualities from public admiration. Perhaps one of the reasons why the finer grades of horse-drawn vehicles are coming into use again in some of the cities, especially for park driving, is because they give the women a chance to show their finery, their new hats, dresses and pretty faces, for, as our lady friends have regretfully realized, the automobile affords them no such opportunity.

The gasoline engine is a great institution, but every farmer with his wife, sons, daughters, and the hired man, know there is plenty of work for man's best friend, the horse, to attend to, and they know that he does it faithfully, without jumping a spark plug or congesting his carbureter. Also the fact that a three-year old colt is a lot younger than a three-year old touring car, counts in the horse's favor, and he makes up in general utility what he may lack in speed or endurance for a day. The horse, viewing the situation from any angle, seems destined to retain its usefulness on the farm and in numerous other situations for many years hence, and those who like horses, which means almost everybody, will be glad of it. While we have horses, we will have horse vehicles—buggies, surreys and wagons. The horse may, in time, be backed off the city pavements, but when it comes to farmers and their families, motors can never displace the horse. Thousands of farmers in the United States do not want motor cars, and will not have them, although they are able financially to own them. With these farmers the horse is a necessity. In consequence, buggies will always be in demand.

Where the Horse Reigns Supreme

Because you and I may have a hankering after a car is no reason to think that the whole world has gone mad over them. There are still some places where the horse reigns supreme, and the automobile has no show whatever. At Bar Harbor, Maine, the famous summer resort patronized by the wealthiest classes of people, motor cars are not permitted, and the horse, used either with saddle or hitched to a stylish trap or carriage, is undisputed king of the road. Shetland ponies serve for the delight of the children in the same way that the full-sized animal serves the convenience and pleasure of the grown-ups at this exclusive resort. In the stables of a famous Hot Springs, Va., hotel about 120 horses are kept all the year round for the use of the fashionable people who spend much of their time there. The carriage house at this hotel accommodates 75 vehicles, including surreys, buckboards, victorias, broughams, park wagons, runabouts, top buggies, breaks, carts, etc. On the 160 miles of splendid roads surrounding Hot Springs automobiles are seldom or never seen.

Also in Yellowstone Park, the government does not look upon motor vehicles with favor. Only horse-drawn vehicles, wagons of the three-seated, canopy top, surrey type are used to transport the thousands of visitors who spend their vacations among the majestic vistas of this great National Park. Within the last few weeks an order for several hundred additional vehicles, all horse-drawn, has been delivered by the contractors at the park gate. Safety and service are absolutely necessary for Yellowstone Park traffic, and it is for this reason that horse-drawn vehicles are chosen instead of automobiles.

We believe we have shown in this article that horse-drawn vehicles are still used, and we think we have given reasons why they will continue to be used. There was always a limit put to the number of people who could buy automobiles. We have not been certain just how far that limit extended, but we are getting to see now that in many sections the buying limit has been nearly reached and about everybody who can afford to own a motor car has bought one. A good many of these buyers never did own a buggy, so their purchase of a car did

not hurt the buggy maker's prospect. Many other automobile owners have not discarded their horse-drawn carriages, but use the two kinds of vehicles side by side. These instances also show that the carriage manufacturer and the dealer have not been hurt to any great extent.

Many people who now own automobiles possess the first, the only and the last one that they will ever buy. They are finding out that they cannot afford the machine, and when their present car wears out they will not be induced to invest again. If they need a vehicle at all their next purchase will be a buggy or some other type of horse-drawn vehicle.

We believe, furthermore, that the same systematic methods and the same amount of brain work expended in a buggy sales room will bring to its proprietor just as much clean profits in proportion to his investment as the average automobile sales room can show at the end of the year. What we want to impress at this time is that if the buggy dealer is not making money enough he can make more by studying his product, doing more and better advertising, and changing his methods, if need be, to conform to the times.

But if the buggy dealer waits until someone comes in and says, "I want to buy a buggy. Is there anything I could say to you that would induce you to sell me one?" that dealer is going to wait a long time between sales. But if he goes out and hustles and looks for people who want buggies, or should want them, he is going to sell out his repository several times over every season. If our buggy and wagon dealers, and our manufacturers of horse-drawn vehicles would push for business as hard and in as many ways as the motor car people are pushing, they would soon realize that there is nothing at all the matter with the vehicle business. If American vehicle manufacturers and dealers can be charged with too much deliberation over an opportunity when it is presented to them, there is a case in point just now in his failing to see his present chances, and we mean by this his opportunity to build up solid trade for the present and the near future by missionary work, and by hustling for which right now is the ideal time.

INDUSTRIAL DEVELOPMENT IN SOUTH AMERICA

South American newspapers commenting on the British embargo on the exportation of coal call attention to the fact that coal can always be had from the United States. The Brazilian press points out the fact that one organization at Rio de Janeiro had, when the British embargo was announced, 6,000 tons of American coal on the ocean en route to Rio de Janeiro. The Review of the River Plate, in its issue of May 14, remarks that if it should transpire that British sources of coal are to be closed temporarily, it will be necessary for Argentina to look elsewhere, and says, "One large industrial company at least in Buenos Aires has recently imported some hundreds of thousands of tons of coal from the United States, finding it satisfactory in quality and equitable as to price."

One vessel for South America, reported by the New York Custom House on June 26, carried to Buenos Aires \$102,000 worth of iron manufactures; \$13,000 worth of cement; \$10,000 worth of lumber; \$36,000 worth of cotton seed oil; \$60,000 worth of petroleum; \$10,000 worth of cotton yarn, and \$10,000 worth of plows. The same vessel carried to Montevideo, Uruguay, \$9,000 worth of cotton seed oil; \$14,000 worth of petroleum; \$6,000 worth of iron manufactures, and smaller values of boots and shoes, hosiery, cotton cloth, groceries, dry goods, automobiles and other miscellaneous merchandise.

Exports from Brazil in the first quarter of the year show a decrease of but 11 per cent. compared with the same period of last year, despite the fact that certain of its European markets are no longer open to trade. This is especially true with reference to Germany, Austria-Hungary and Belgium, which have been large purchasers of certain Brazilian products, especially coffee. The chief decrease in the exports occurs in india rub-

ber, of which the exports in the three months ending with March, 1913, were but \$10,000,000 against \$14,250,000 in the same months of last year. Coffee meantime shows an increase of about \$1,500,000, and sugar also shows an increase, though Brazil's exports of sugar are small when compared with those of coffee and india rubber.

Vessels clearing from the ports of the United States for South America show a material increase in April of the current year amounting to 206,492 tons against 179,131 tons in April of last year. For the ten months ending with April there is a decline, the figures being for the ten months July 1 to April 30, 1914-15, 1,400-701 tons against 2,076,562 in the corresponding months of last year. These figures of tonnage of vessels clearing for South America are in accord with the figures of value of merchandise exported to that continent, which show an increase in April over the same month of last year, but a decline for the entire fiscal year period, July 1 to April 30.

Argentina seems likely to have in 1915 a larger "favorable trade balance" than any other country except United States. Her trade statistics for the first quarter of the current year show a favorable balance (excess of exports over imports) of over \$100,000,000 against \$60,000,000 for the entire calendar year 1914. There are only a dozen countries of the world in which the exports exceed the imports, and, if present conditions in Argentina continue, that country will rank next to the United States in the favorable balance of trade for the year. The principal countries having a favorable balance in 1914 were, United States, \$436,000,000; India \$197,000,000; Russia, \$179,000,000; South Africa, \$133,000,000; Argentina, \$60,000,000; Cuba, \$37,000,000; Mexico, \$31,000,000, and Chile, \$24,000,000, but the current year seems likely to bring the favorable balance of the United States up to \$1,000,000,000, and that of Argentina to approximately \$300,000,000, if the present favorable conditions continue. This large increase in our own favorable balance and also that of Argentina is due in part to a reduction of imports, as well as an increase in exports.

One ship leaving for South America, exported by the New York Custom House on June 21, carried over \$150,000 worth of merchandise to Rio de Janeiro, including \$26,000 worth of leather; \$15,000 worth of malt; \$13,000 worth of flour; \$10,000 worth of cotton seed oil; \$10,000 worth of rosin; \$10,000 worth of iron and steel manufactures; \$9,000 worth of tin plate, and \$5,000 worth of belting; while another vessel reported for that city two days late, carried \$180,000 worth of merchandise, including \$26,000 worth of electrical material; \$8,000 worth of iron manufactures; \$4,000 worth of petroleum; \$60,000 worth of flour; \$11,000 worth of gasoline, and \$17,000 worth of condensed milk.

Copies of the Chilean newspapers arriving here contain the details of the inauguration by the President of that Republic on May 18 of the great copper works established by the Guggenheim interests of the United States at Chuquicama in the Province of Antofosgasta, in the northern part of Chile. It is expected that the work of this organization will make Chile the second copper producing country of the world, and exceeded only by the United States in the quantity and value of its copper product.

Exports of coal from the United States to Argentina in April were 79,531 tons against 18,966 in April of last year; to Brazil, 66,582 against 15,831, and to Uruguay 36,503 against 4,179 tons in the corresponding month of 1914. For the ten months ending with April the figures are: To Argentina, 297,328 tons, against 118,354 in the same months of 1914; to Brazil, 339,597 against 212,668, and to Uruguay, 77,270 against 44,671 tons in the corresponding months of last year.

Trade of the United States with South America continues to improve. Exports to that continent in April of the current year were 20 per cent. in excess of last year, and the imports there-

from 47 per cent. greater than in the same month of last year. Exports increased to Argentina, Brazil, Uruguay, Colombia, Venezuela and Ecuador, while those to Bolivia, Chile and Peru show a slight decrease. The imports show an increase in the case of every country of South America, those from Argentina increasing about 50 per cent., from Brazil 27 per cent., and from Uruguay 93 per cent. The slight fall in the exports to the west coast is due to the general falling off in the purchasing power of that section due to the reduction of sales of their products to Europe, which is usually the largest purchaser of their exportable merchandise.

Advices from Buenos Aires indicate that the customs receipts from imports are rapidly improving, those of the month of April being but 22 per cent. below those of April of last year, while March showed a decrease of 31 per cent., February 49 per cent., and January 63 per cent., when compared with the corresponding months of last year, thus indicating that in the more recent months conditions are materially improving, when compared with the earlier months of the year.

One vessel leaving New York for Santos, Brazil, a few days ago, carried 856,440 gallons of petroleum, and another ship leaving on the same day for Callao, Peru, carried 5,600 barrels of cement.

Imports during the last ten days of June at the Port of New York have exceeded exports by about 25 per cent.—Bulletin of the National City Bank of New York.

HALF OF ALL FOREST FIRES ARE PREVENTABLE

With the opening of the season of fire danger on most of the national forests, the forest service is sending broadcast a warning that more than half of the forest fires in the United States are due to carelessness or other preventable causes, starting from campers, railroad locomotives, brush burning, incendiaries, and sawmills.

This statement is based on an analysis of statistics compiled from the forest fire records of the last season, when more than 7,000 fires were reported on national forests alone and approximately 10,000 on state and private holdings in the 18 states which received federal co-operation in fire protection under the Weeks law, namely, Maine, New Hampshire, Vermont, Massachusetts, Connecticut, New York, New Jersey, Maryland, West Virginia, Kentucky, Michigan, Wisconsin, Minnesota, South Dakota, Montana, Idaho, Washington and Oregon.

Forest fires destroy millions of dollars' worth of timber and other property every year, and in some years cause considerable loss of life. It has been estimated from the best information obtainable that forest fires last year burned over an area of approximately 6,000,000 acres with a total loss of at least \$9,500,000.

MORE THAN 200 FIRMS NOW IN WOOD WASTE EXCHANGE

Since the inauguration of its Wood Waste Exchange, on April 15 last, the Forest Service has been requested to list 147 mills and factories as having waste material for sale, while during the same time 76 other wood-using concerns have asked to be listed as desiring to purchase waste of a wide range of species in specified dimensions or as mill or factory run. The latter have been included in the list of "Opportunities to Sell Waste" which is sent monthly to concerns which have waste material for sale. This list is growing steadily, but the Forest Service is anxious to accelerate its rate of growth inasmuch as it comprises only about half as many buyers as there are sellers listed under "Opportunities to Buy Waste."

The Forest Service has just been notified by a large novelty manufacturing concern in New York City that the Wood Waste

Exchange has enabled it to obtain its raw material at a considerable saving of money. This factory uses small, semi-finished blocks of dogwood which it makes into patent spool holders. The factory's requirements were published under "Opportunities to Sell Waste" and a manufacturer of shuttle blocks promptly seized the opportunity to dispose of the pieces of dogwood which previously were discarded as waste in his factory.

Similarly, other buyers are now, through the Wood Waste Exchange, obtaining material of good quality at a cost lower than they had been paying for raw material in the form of logs or standard lumber, and without themselves having to accumulate waste by cutting raw material into required sizes. On the other hand, many mills and factories which were burning their waste or disposing of it at firewood prices, are now selling it at a fair profit.

The Forest Service desires the co-operation of all manufacturers of small wooden commodities and invites them to list their requirements with the Wood Waste Exchange. There is no charge for this service.

INCOME OF \$5,000 NECESSARY

No man with a family can live in Buenos Aires in the style to which he should be entitled by his business activities on less than \$5,000 per year, according to Commercial Attache Albert Hale, of that city. It can not be said that every man in Buenos Aires draws that salary, but by whatever less than this sum he is compensated, by so much must he restrict his expenses and lose in the business and social scale. The conclusion reached by those who know Buenos Aires well, and who are able thereby to make intelligent comparison with the cost of living in the large cities of the United States, is that a salary of \$5,000 here, while it may look ample, is moderate. The cost of living has not such wide limits as it has in New York or Chicago or Washington, because in these cities one lives according to one's income, whereas in Buenos Aires one must live according to one's social position if he is to represent his company in a style that they may reasonably expect.

These are conservative estimates, and have met the approval of many whose experience allows them to speak with authority. These facts must be given serious consideration by manufacturers or firms who are thinking of sending representatives to Buenos Aires. If they are not represented properly, they fail to get that very influence which it is the object of personal representation to gain.

Another factor in the high cost of living in Buenos Aires which pertains particularly to those who, however much they intend to make their homes in South America, are bound by family ties to their homes in the United States, is that of the necessary expense for traveling back and forth between North and South America. The representative must at times return home, not only to make his report, but to get again into personal touch with the interests he is promoting. Taking this factor into consideration, the best results can be obtained by considering a proper salary for a permanently established representative to be between \$7,500 and \$10,000 per year.

FIFTH AVENUE TO HAVE NEW TYPE BUS

The Fifth Avenue Coach Company, of New York City, which operates a line of motor busses, has designed and built in its own shops a new type of motor bus body which has many advantages over the kind previously employed.

Heaters are placed under the floor instead of in the sides of the body. Push buttons are provided for each seat. A double hand rail on the rear stairway is designed for greater safety; ten more square feet have been added to the window space and interior electric lighting facilities have been increased.

The seats are transverse with a center aisle. Twenty-two passengers can be seated on the lower deck. The use of aluminum panels and high grade alloy steel have reduced the weight and volume of the interior equipment.

REVIEW OF N. I. & V. A. ACTIVITIES

What Has Been Accomplished and An Outline of What Is to Be Done in Future

The National Implement & Vehicle Association has issued a bulletin to the members of the association reviewing the activity of the organization during the past 12 months and stating the scope of work which confronts the association. The bulletin, which is signed by E. W. McCullough, secretary and general manager, follows:

The past twelve months have been so strenuous and so filled with important issues, due to the disturbed industrial conditions that the present is a propitious occasion for a brief review of our activities; of the results accomplished, and a consideration of the problems before us.

The Federal Trade Commission and Clayton Laws—Additional business legislation in the form of the Federal Trade Commission and Clayton laws has been enacted. We have approved the general intent of the Commission law; we have disapproved of the Clayton law, and as the result of our efforts, and those of other organizations, some of its bad features have been modified. This legislation, however, is of continuing interest and its study is one of the association's problems for the future.

Business Revival—We have declared that fundamental conditions in this country are sound. Believing that the American banker is in an especially favorable position to help in the restoration of confidence, we have addressed every banker in the United States, urging him to preach prosperity, the diversification of crops and other fundamental principles. Our efforts in this direction have been effectual as evidenced by the co-operative spirit of the replies.

State Legislation—An important subject to which much attention has been given. If a bill of interest was introduced, every member concerned was advised and his co-operation assisted to defeat bad legislation and to help good measures. The results speak for themselves, as witness the failure of the Oklahoma repair parts law and the Kansas partial payment mortgage law.

Foreign Trade—Our officials have been instrumental in securing the employment of a special investigator in foreign countries for our lines. We have been represented at all important conferences on foreign trade. Our foreign trade managers have benefited much by their meetings.

Standardization of Products—Much has been accomplished—witness the completed plans of the plow and farm wagon departments. There is much that can not be accomplished in those and other lines.

Standardization of Advertising—The sales managers' department has adopted standard sizes for catalogs, circulars and folders. Recommendations and suggestions for the elimination of waste in the distribution of advertising have been made. Review them frequently.

Uniform Property Statement—A standard form has been perfected and meets with the approval of the dealers. The giving of a statement will now be the usual practice—the "Reasons Why" are being prepared by the credits and collections committee which will show why it is to the dealer's advantage to furnish the uniform statement and why to the advantage of the traveler to secure one.

A Few Facts About Agriculture—A simple treatise for the traveler and dealer—a work just commenced but one of great promise.

Patent Litigation—Our patents committee has volunteered its services with a view toward the elimination of patent litigation. If this expense can be avoided through the committee's efforts it should have the gratitude of the members involved.

Sisal Twine Embargo—The action of our association in taking up this problem at the request of the twine manufacturers when their efforts had failed, resulted in the accomplishment of results of value not only to them, but to the whole country as

well. The Mexican blockade of Progreso seriously threatened the sisal fibre supply so necessary for the harvesting of our crops. Through our efforts, supplemented by those of the federated dealers, the great importance of the matter was brought to the attention of the state department at Washington by a series of telegrams and other means so that the danger was quickly relieved.

Returned Goods—General recommendations have been adopted by the sales managers' department which should eliminate much of the friction now experienced. These recommendations in printed form, may be obtained at cost prices from the general offices.

Work Before Us

Co-operation with Federal Trade Commission—It is incumbent on us to give continued attention to the activities of the Federal trade commission and to co-operate with it in every possible way. Our advisory committee has been commissioned with this responsibility.

Rural Credits—A special committee has been appointed for the study of rural credits, a matter in which we are greatly, even though not directly, interested. Legislation on this subject will doubtless be enacted in the near future.

Stoppage in Transit—Our protest against the discontinuance of stoppage in transit service has been heard, but the case has not yet been decided. Our special attorney has this matter in hand.

Export Rates—The railroads have made an increase in export rates—we have filed formal complaint with the Interstate Commerce Commission and are represented by special counsel.

Other Freight Traffic Problems—(1) The railroads propose to increase the agricultural implement rates throughout the western territory two cents per hundred. The tariffs have been suspended, but the situation requires our careful attention. (2) In Missouri the railroads have proposed increased freight and passenger rates—we have been represented at the hearings, but the case is not yet closed. (3) Certain concerns manufacturing light vehicles exclusively have petitioned for lower carload minima in such a manner as to disturb the mixing privileges into southwestern territory, a matter which shall have our special attention.

We think that you will see in this recital of the year's accomplishments, evidence of marked progress. We trust that in connection with the problems before us, you will use every effort to assist in their solution so that we may show at the October convention a record of achievements unsurpassed in the history of the association.

May we suggest also that you aid us in strengthening our organization through the addition of new members—we urge you to address some of these non-members or take up personally with their officials the advantages to them from membership.

ANNOUNCE ROAD BUILDING BULLETIN

The "good roads" movement is of great importance to vehicle manufacturers and subjects of pertinent interest and value as regards road building, repair and maintenance are deserving of serious consideration. We publish herewith the announcement of a new bulletin dealing with the different phases of road work, which can be had free of cost by those interested, from the Du Pont Powder Co., Wilmington, Del.

Since farmers have become the chief purchasers of automobiles, interest in better roads has increased wonderfully. But as every motorist knows, methods of road maintenance are sadly in need of organization.

The Du Pont Powder Co., realizing the growing need for an exhaustive bulletin written in a plain, popular style covering the location, building and maintenance of roads, announces the publication of comprehensive treatise on this subject for free distribution.

Although the obvious purpose of this publication is to promote the rational use of explosives in road work, the text is

much broader in its scope and covers phases of the subject far remote from the use of explosives. The introductory chapter consists of a discussion of the need of permanent roads and highways and their relation to civic and economic progress. Recommendations are given for permanent locations and the width and character of road desirable under different conditions. Detailed advice is given with regard to the removal of stumps and boulders from the right of way.

A chapter on drainage discusses every phase of the subject from the crowning of the surface to the control of large streams. Advice is given with regard to cut and fill work in hard ground and in rock for both straight and side hill cuts.

The chapter on road building equipment includes everything from the smallest drag scraper to rock crushers and steam shovels.

Special attention is given to the use of different classes of road surfacing material, and advice is given on the construction of earth, shell, sand clay, macadam, brick and concrete roads. This is followed by a chapter on the upkeep of country roads and by a treatise on explosives and their handling and use.

The book is fully illustrated with photographic views and special plan and sectional drawings of roads.

THE HORSE AND MOTOR TRUCKS

Those interested in the future of the horse and also many who are interested in the advancement of the motor truck industry, will no doubt be surprised to learn, says E. S. Foljambe, editor of *The Commercial Car Journal*, that only one and five-tenths per cent. of horses have been displaced by motor vehicles in the transportation field. Mr. Foljambe says further:

Prior to the introduction of the parcel post the Interstate Commerce Commission compiled figures on merchandise transportation. From these government figures it has been deduced that the total volume of transportation in the United States, the steamships and railroads combined, handle but 15 per cent., leaving the other 85 per cent. to be moved by horse and wagon or motor-driven vehicles. Yet during exactly the period representing the introduction and growth of power-driven vehicles, namely, from 1900 to 1910, the government statistics show an increase of 8.6 per cent. in the number of horses in use on farms and 11.7 per cent. in mules and other draft animals, making a total of 24,000,000 in use on farms alone.

A realization of how little inroad the truck has already made is borne in upon us when we consider the following figures: From 1908 until the present time, inclusive, there has been produced in the United States approximately 180,000 commercial cars. Of these, 100,000 to 120,000 are probably now in use. On an average, counting all-sized vehicles, these do not displace more than three horses each, or a total number of horses displaced of not over 375,000. When this number is compared to the total number of horses and draft animals in use, 26,000,000, it is found that commercial cars have in reality displaced less than 1.5 per cent., and even taking into consideration the motor-driven farm tractor, the possible field still not covered is fully 98 per cent.

By transfer is meant the movement of maximum loads from one point directly to a destination without lessening the load, such as the transfer from farm or factories to railroads or steamships, from mine to smelter, from stores to distributing points, etc. This class of haulage has been developed by the large truck to a high class of efficiency, but the average of even this class of load has been shown to be in the neighborhood of but 4,500 pounds.

By delivery is meant distribution of goods to numerous consignees, in which case there is an ever-diminishing load upon the vehicle, and almost at no time does it carry its maximum. This is the field for the medium and small-sized truck, and embraces from 75 to 80 per cent. by volume of all merchandise transportation.

Transfer includes the raw product, while delivery concerns itself usually with the finished product. The total tonnage handled is practically the same, but the volume is vastly greater, the finished product, as a rule, occupying many times the space of the raw material. This necessitates a larger number of delivery vehicles of large volume but small load capacity, as compared to those required to handle the unfinished product.

In the light of these figures it is difficult to figure out how the business world would be able to do without the assistance of the horse, even if it was deemed desirable to do so, generally. It would require an increase in truck manufacturing so great as to be an utter impossibility for many years to come. On the other hand, the figures show that, without the advent of the motor trucks, horses would not have been able to take care of the transportation which employs horses and trucks unless there had been a large increase in horse-breeding operations.

SIMPLEX TAKES OVER CRANE CO.

The Simplex Automobile Co., of New Brunswick, N. J., has bought out the entire plant, assets and good will of the Crane Motor Car Co., Bayonne, N. J. Henry M. Crane, former president of the Crane Motor Car Co., is now second vice-president of the Simplex company, and is taking direct charge of the engineering work at the New Brunswick plant, with R. B. Wasson as factory manager.

The Simplex company will continue the models made for 1915 but will build in addition a new model which is practically identical with the Crane model 4. This will be known as the Crane model Simplex and is intended for those who desire extremely careful workmanship, regardless of the price of the car. The exact price has not as yet been fixed. The car will be built with a wheelbase of 143½ in. and a body space of 112½ in. The tire equipment will be 36 x 4½ forward and 37 x 5 rear. The motor is a six with 4¾ bore and 6¼ stroke with the cylinders cast in two blocks of three. A rigid crankshaft 2¾ in. in diameter is one of the features of the motor. The carburetor is a Newcomb-Crane and the camshaft, magneto, starting motor, lighting generator, water and tire pump are all operated through silent chains. Steering is left with center control.

The Crane Motor Car Co. has been known to motorists in the east as a concern devoted to the building of high-priced cars, largely to order, although the car was made in standard models. The model 4, chassis alone, listed at \$8,000, and it was built with a view of providing the last word in automobile luxury and finish. The bodies for this chassis were generally made by the large body makers to suit the special requirements of the purchaser with the result that the finished cars were among the highest-priced products in America.

TRADE VALUE OF A SIGNATURE

The Hankow, China, consulate would like to draw the attention of American firms attempting to enter the foreign trade to the practice, on the part of some of them in communicating with foreign concerns, of sending out trade letters with no written signature, but with only a typewritten signature, usually the name of the firm alone. This is almost invariably construed by foreign merchants as a sign that the American house which does it lacks any real interest in the possible sale of its goods abroad.

The result of this policy is well illustrated by a remark made to the writer by a local manager of a foreign firm. His statement was to the effect that when he receives a trade letter from America, if he sees that the inquirer is sufficiently interested in the marketing of his goods to sign his letter, he always gives such communication the courtesy of a reply, while if he notices that no signature is affixed to the letter it is promptly consigned to the waste-paper basket. It would be well for American firms to bear in mind this attitude of the foreign merchant, as it is doubtless the attitude assumed by many others.

Making Aluminum Automobile Bodies*

The Foundry Practice Developed at the Buffalo Plant of the Aluminum Castings Company for Producing Large Castings of Very Thin Sections

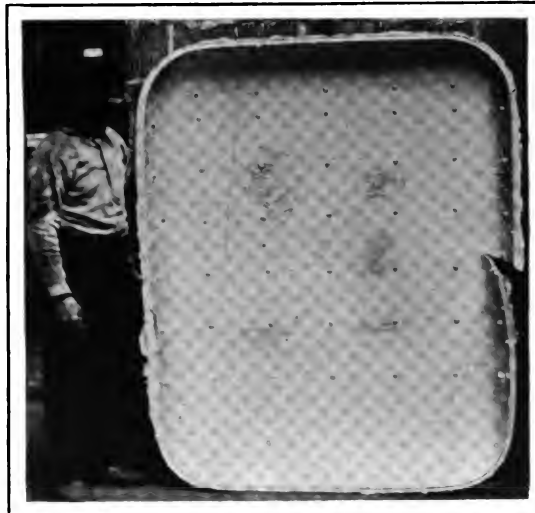
The building of an automobile body from aluminum castings ten years ago was hardly practicable, for at that time methods employed in aluminum foundries and the knowledge of mixing suitable alloys to get the best results did not warrant attempts to make an aluminum casting light enough to compete with bodies constructed of wood and sheet metal. Even a comparatively few years ago 3/16 in. was regarded as about the minimum thickness for aluminum castings of large area. Since then refinement in methods has made it possible to decrease the section of such castings considerably further, and the large sections of aluminum castings now in use in making the touring and enclosed bodies of the Pierce-Arrow motor cars are but 1/8 in. in thickness throughout the greater part of their surfaces.

These castings are made at the Elmwood plant of the Aluminum Castings Co., in Buffalo, N. Y., and some interesting foundry practices have been developed in making them. For some years past cast aluminum has been used by a number of manufacturers for dashes, but the Pierce-Arrow Motor Car Co., almost from the time it started to build touring cars, has used cast aluminum throughout for its car bodies.

The advantages claimed for aluminum construction are that the alumi-

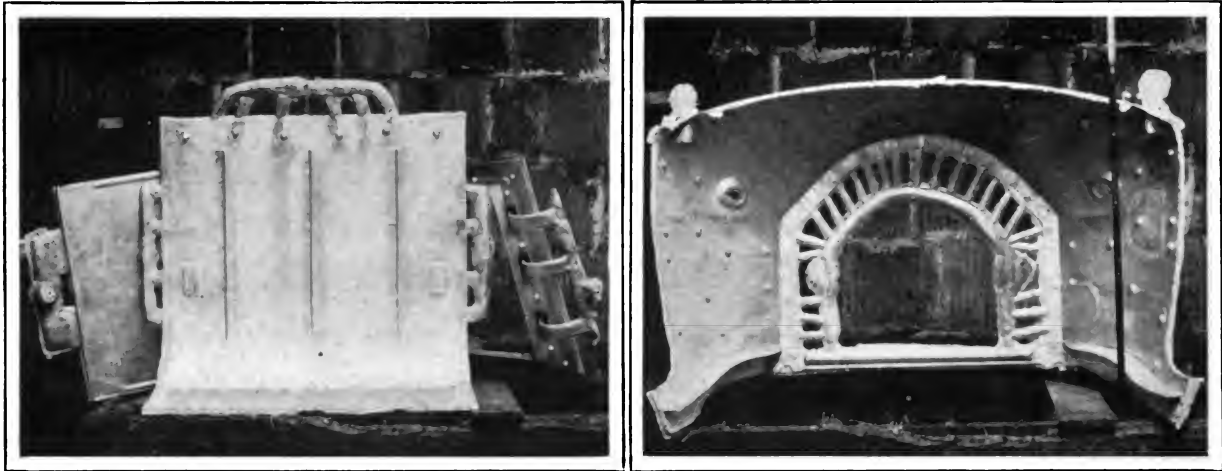
num bodies are lighter than those made of sheet metal and have a rigid surface that will not dent as easily in handling; also that they provide an increased factor of safety in case of accident, as a cast aluminum body will not crush as easily as a sheet metal body. In addition to this, other advantages claimed are that the cast aluminum offers a surface which retains paint better than sheet metal and the rigidity of the body makes it much more durable, as even after many years' use it does not twist and give, causing disagreeable squeak and failure of the different parts to maintain their joints.

The ability to produce thin aluminum castings is due to long experience in this special line of work, combining refinement of foundry practice with the knowledge of suitable alloys so that a casting can be secured which has the necessary strength and physical properties. The size of some of these castings is indicated by the fact that one used for the top of a coupe body is approximately 5 ft. 6 in. by 4 ft. 6 in. and only about 1/8 in. in thickness. One of these castings is shown in one of the illustrations, the fracture on the right showing the thinness of the metal. Specifications require that the variation in weight must not exceed 10 per cent. of the weight of the aluminum pattern. That means very close molding, as the



The upper photograph shows an aluminum casting 4 ft. 6 in. by 5 ft. 6 in. by 1/8 in. thick for the top of a coupe. Another photograph shows how an aluminum casting for automobile body is poured with four ladles at once. The third photograph is a reproduction of the method of skin-drying a mold with an oil torch after the pattern is drawn

*This article and illustrations reproduced through courtesy of The Iron Age.



Two illustrations of the methods of gating aluminum automobile castings. In the photograph to the left a door is shown on the left poured with one sprue having two large gates and poured at an angle of 30 degrees. The casting in the center of the same picture is a side body casting, poured with three sprues and 14 gates, all sprues being poured at once. Another method of gating is shown in the third casting in the same photograph, that from underneath, it being poured with one sprue and three gates. The illustration on the right shows a very difficult casting to pour and a fine sample of gating. It has four sprues and 26 gates and is poured flat with the curve extending downwards

casting must be kept within one one-hundredth of an inch of the thickness of the pattern. This one one-hundredth of an inch must include all variations due to rapping and champing the flask and pouring. Great care is required in pouring, as this affects the weight. If the molds are poured fast, the metal is denser than if poured slowly. The castings must be free from even the most minute cracks and pin holes and they are closely inspected for imperfections.

Molding Practice Unusually Difficult

While the theory of molding the aluminum body castings is simple, the practice is unusually difficult, but in spite of this the losses due to imperfect castings are quite small. Molds are all rammed by hand on the floor, the surfaces being skin-dried with an oil torch after the pattern is drawn so that the metal will run properly and the castings will have smooth surface. The larger castings will weigh from 25 to 30 pounds. The molds are poured with four or five ladles at the same time in order to make sure that the metal will run over the entire surface. One of the photographs shows a pouring operation and another shows a mold being skin-dried. Because

of the size of the section it is necessary to use two cubic yards of sand for the molds of some of the 25-pound castings. Very heavy wooden flasks are used with plaster of paris match with wooden ribs. The flask is shaken out from two to five minutes after the casting is poured to allow for shrinking and to prevent cracking. A great deal of attention to the proper setting of chills is required, the chills being of the greatest importance in getting good castings. Chills are required to prevent cracking in the thicker parts of the metal. In making some castings, as many as 200 chills are used. A striking illustration of this is shown in a photograph.

Various Methods of Gating

Molds for castings with curved surfaces are poured flat. In case the casting is a flat piece such as a limousine door, the flask is tipped to an angle of 30 degrees, so that the metal will run. A mold for a casting with an entirely flat surface is poured from a sprue hole and two gates. For pouring molds for a curved casting two to four or five sprue holes are pro-



A view of a mold of a large aluminum automobile casting revealing the great number of chills that are set to prevent cracking



A photograph of the practice of hammering sections of aluminum castings for automobile bodies to fit wooden molds in the Pierce-Arrow plant

vided, each with four to six gates. One of the illustrations shows the method of gating to obtain the proper flow of metal. The door shown on the left of this illustration is poured with one sprue with two large gates, this mold being poured at an angle of 30 degrees. In the center is a side body casting that is poured with three sprues and 14 gates, all the sprues being poured at once. Another method of gating is from underneath, as shown in the window-frame casting on the extreme right, this being poured with one sprue and three gates. A very difficult casting to pour and a fine example of gating is shown in the illustration of a dash that is poured flat with the curve extending downward. This mold has four sprues and 26 gates, no raisers being used except the sprues themselves. After the castings are taken from the molds they are cleaned and the fins are chopped off, and then they are ready for shipment to the automobile plant.

Care Necessary in Finishing Castings

Great care is required in finishing the castings at the Pierce-Arrow plant before the sections are assembled into car bodies. Owing to the thinness of the metal many of the castings are warped, but the metal is sufficiently pliable to permit straightening. Some of these are hammered into shape by means of

a wooden mallet or rawhide hammer, but parts with considerable curved surface are clamped on wooden molds of the shape of the piece and straightened with a steel hammer and wood block, as shown in one of the illustrations. After being straightened the castings are hand finished by filing and drawing, and polished with an emery cloth as shown in another photograph. After finishing, the castings are drilled and the parts are assembled by cold riveting to form the body. There being no wooden frame work, the strength of the body is therefore entirely dependent on the aluminum castings.

The only wood used in the construction is the sills for the doors and windows, partitions, floor and the driver's seat. The joints are all at the lines of the body, and these are cast with ribs, so that when the body is assembled, it has the appearance of one piece, the body being so designed that none of the joints are left open. One of the photographs shows how the body is built by sections and how the castings are assembled and fastened together by riveting, while another illustration shows the body nearly finished.

Recently the strength of the aluminum body was put to a severe test, when a limousine that, in attempting to escape a grade crossing accident, was swerved around to the side of



A view of the method of hand finishing the aluminum sections by filing and drawing and polishing with an emery cloth in the Pierce-Arrow plant



The method of assembling the sections to form a body and showing how they are united

the railroad track. The rear end of the car was hit by the tender of a fast train and was badly wrecked on one side and the car was rolled down an embankment. The body back of the hood was damaged very slightly, the glass in the tonneau was not broken, and the occupants, consisting of three women and chauffeur, were uninjured.

AN UNCONSIDERED FINGER

Recently a foreman in one of the principal railway work shops, says the N. Z. Railway Officers' Advocate, when cross-



An aluminum body nearly finished showing the little woodwork used in its construction

ing the yard to where some men were busily engaged unloading a quantity of very heavy sheet iron, picked up a portion of a human finger nearly an inch in length. On mentioning the fact to the gang, one of the workmen looked at his hand and exclaimed, "By Jove, it's mine. I felt a bit of a pinch a while ago, but I didn't know my finger was off." The square edges of two plates of the iron coming together had squeezed off the point of the man's finger, at the same time closing the stump, so that no blood escaped.

THE NATIONAL WEALTH

The Federal Census Bureau has estimated the total wealth of the United States at \$187,739,000,000, which is the equivalent of \$1,965 for each man, woman and child in the country.



A view of one floor of the body department of the Pierce-Arrow plant

FRANKLIN WORKS DISCONTINUE APPRENTICE SCHOOL

Cost per Graduate, Scientific Management in Minimizing Demand for Labor and Public Vocational Schools the Reasons

To abandon a works apprenticeship school seems a retrograde step at this time of prominent consideration to shop education in mechanical pursuits; but the H. H. Franklin Mfg. Co., maker of the Franklin automobile, Syracuse, N. Y., has done just this thing and for very good reasons, so it believes. The following account of the experience, recently printed in the *Iron Age*, will show why the company no longer conducts its technical classes. Briefly, the cost per individual graduated has been high, but the continued need for new employes has practically vanished with the expansion of scientific management within the works. A widening circle of satisfied workers and a razing of the peaks of the usual highly variable demands for labor have resulted, and the new conditions have naturally lightened the tasks of the employing officers. Besides this gain derived by the inauguration of scientific management in maintaining substantially a constant number of employes throughout the year, a vocational high school is being erected in Syracuse and from this the company is sure it can secure when needed boys who, with some additional expenditure on them, can be developed quickly to meet the company's requirements. In fact the company holds that applicants from the vocational school would know what they want and would be more than likely retained in any continuation course which the company might plan.

The per capita cost of the graduate, so to speak, from the company's apprenticeship school was, however, an important item in the decision to discontinue the school. The total cost of running the school, not comprehending overheads which could properly be charged, was \$17,000 for the four years covering the existence of the school, and the total output was 28 or a cost to the company of \$607 for each apprentice. The company's employment figures show that the cost of selecting a workman and making him the equivalent of the apprenticeship school output is \$50, and the company considers it can charge itself with a loss of $\$17,000 - 28 \times \$50 = \$15,600$, or, say, \$15,000.

The school was established to give boys not only a training in the regular work of manufacturing, but some instruction in technical subjects. A graduate of Purdue University was engaged for this purpose, and the boys were not, as in the old system of apprenticeship training, turned loose to the tender mercies of this or that foreman. The course was for 200 weeks, or four years.

The class room and text book work, two periods of two hours each were arranged every week. In the first ten weeks were given over to a review of arithmetic and 40 weeks to studying algebra. The second year's technical instruction was devoted to plane geometry. Half of the third year was taken up with trigonometry and the other half with studying the elements of machine design. Elements of machine design and shop mathematics constituted the fourth year's work. These lessons were for one-half to three-fourths hour and the remainder of each two-hour period was taken up with mechanical drawing work in the first two years and with the analysis of different machines in the last two years. A short course in shop supervision was also undertaken. The shop training was as follows:

First year—	
Drilling	10 weeks
Milling	24 weeks
Lathe work	16 weeks
Second year—	
Lathe work	10 weeks
Bench work	12 weeks
Turret lathes	8 weeks
Gear shapers	8 weeks
Automatic screw machines.....	12 weeks

Third year—	
Grinding	8 weeks
Tool work	18 weeks
Erecting	12 weeks
Small assembly	12 weeks
Fourth year—	
Tool drawing	26 weeks
Tool work	24 weeks

Wages Paid to Apprentices

The students received payment for actual service, totaling 2,700 hours each year. The rate for the first year was 11 cents per hour; for the second year, 13½ cents per hour; for the first half of the third year, 16 cents, and the second half 18½ cents, for the first half of the fourth year, 21 cents, and for the second half, 23½ cents. When the student satisfactorily completed his term of instruction of 10,800 hours, the company paid him a bonus of \$100. This was promised as an inducement to him to make the effort to finish the course and he was presented also with a diploma.

The underlying idea in providing the course was naturally to fit persons for positions of usefulness and responsibility in the company's service. With the changes in conditions, such as the public vocational school and a reduced need for new employes, as already mentioned, the company has come to regard its own school as no longer the main hope it had of filling its supervising positions. At no time, however, did it expect the student to remain against his wishes nor that necessarily he would continue with the company after the expiration of the course, but there was a mutual agreement covering the cessation of relations. The application which the student made formally for entrance into the work breathed a broad-gauge attitude, demanding applied, faithful interest on the part of the student and offering in return on the part of the company and at a generous wage rate to instruct the student in the machinist's art and trades. Applications were limited to boys of 17 to 20 years of age. The first 12 weeks constituted a term of trial.

Figuring the Cost of the School

With regard to the item covering first year's pay, there were 31 students who finished their first year. Not counting any losses to the company at all for instruction in this year, the student has received 11 cents per hour for 2,700 hours. Those who stayed less than one year averaged three months, and as they received at least 10 cents a day, besides involving other incidental expenses the per capita cost is put at \$100 apiece. This cost per student is about \$600 for each graduate as stated.

The actualities of the technical course are that it was put into operation on April 4, 1910; that up to November 1, 1914, there were 79 applications; that of this number, 59 were accepted; that of the 59, 52 took up the work and that of the 52 entering, 28 remained in the course, or about one-third as many as applied and one-half as many as entered. Those who resigned left for the following reasons: Lack of ability, or lack of interest, 10; to obtain other positions, 3; for higher education, 2; due to low wage, 2; sickness, 2; marriage, 2, and for reasons unknown probably due to low wage or lack of interest in the work, 3.

The student cost has been figured as follows:

Instructor's salary, at \$700.....	\$2,800
First year pay for entrants, 31 at \$300.....	9,300
Expense in pay for less than one year for 21, at \$100....	2,100
Prize for graduates at \$100.....	2,800
Total paid	\$17,000

This total figure does not include rental for building occupied, light, heat, or depreciation, repair, interest on buildings, machines and other physical equipment. It does not include allowance for extra foremanship in the shops, that is, time taken by regular foremen, nor miscellaneous expense of correspondence, committee meetings or student class supplies. The \$700 for instructor's salary is somewhat less than one-half of that of the person acting as instructor; the remainder of his salary being devoted to instruction in repairmen's courses and is not included in apprenticeship school.

CONCERNING AMERICAN TRUCKS

The following article concerning American trucks, as compared with British standards, which appeared in a recent issue of *Commercial Motor*, of London, Eng., will no doubt prove of interest to our readers. Henry Sturmev is well known on this side of the Atlantic, having traveled extensively in this country and given special attention to the manufacture of commercial vehicles.

Ever since my first visit to the motor industry of the United States—such as it was then—in 1908, I have kept pretty closely in touch with the American trade, and, particularly of late years, with the commercial vehicle or "truck" industry, as it is termed there. Here let me say I like the appellation "truck" better than "commercial-motor vehicle." It is short, less cumbersome and more to the point than our somewhat cumbrous designation. Well, to return to the vehicle itself. It may be generally stated that there are two classes of motor truck built in the United States, just as there are two classes of touring cars. As with us here, there are firms building both types of vehicle and building them entirely, to the same extent as is done here, in their own factories, and there are firms, on the other hand, whose trucks are entirely assembled productions, built up of standardized units supplied by the component houses. There is almost every intermediate stage between these two extremes, and, speaking generally, it may be said that standardized "trade" components enter more generally—or more widely—into the composition of American trucks than is the case with us largely for the reason that there are more firms specializing upon the production of component parts there than here, and that, as a consequence, such parts can be obtained both more readily and more cheaply there, owing to the extent of their production—and quantity production upon strictly standardized lines is America's only way to counterbalance the effect on costings of her high wages.

As with us, nearly all the firms in the states who are making both pleasure and commercial cars, and making them mainly or entirely in their own factories—such as the "three P's," the Packard, Peerless, and Pierce-Arrow—are making several models of each type, with the consequence that, while they are undoubtedly very good, owing to comparatively small quantities in which individual models are produced, the cost of production, and hence the selling price, of these types is substantially higher than with us, and it may be said that, generally speaking, this applies to all of the larger load wagons—from three tons up—made in the states, as, of course, quantities in large-load requirements are less and standardized components more difficult to obtain, so that it will be found that the average prices of three, four, and five-ton truck chassis are around \$3,250 (£677), \$3,750 (£786), and \$4,500 (£937), as compared with the figures we are acquainted with here. The prices of many are considerably—£100 to £150—higher than this, and it may also be incidentally mentioned that—doubtless owing to the absence of axle-weight restrictions—trucks are built to much higher load capacities there than here, seven-ton trucks being quite common, while some models run as high as ten tons.

When it comes to the smaller load vehicles, we get far more "assembly propositions," as there is a number of firms specializing on the production of engines, clutches, transmissions, steering gear, axles, etc., each firm making one component only and producing in large quantities at very reasonable prices, so that it is quite usual for firms of car builders in their catalogues to confine their specifications to the mention of the standardized components they employ, and some idea of the extent to which these standardized components enter into the construction of American trucks may be gleaned when I say that, for example, 19 makes of trucks embody Wisconsin engines, and Buda, Rutenber, and Continental engines have each probably nearly as many adherents, while Ross steering gears are employed upon no fewer than 85. Naturally, under these manufacturing conditions, while prices on the one-and-a-half and two-ton wagons, which are made entirely, or nearly so by their producers, are substantially higher than with us, there is

a very large number of trucks of two tons and under which are listed at less than \$2,000 (£416), while two firms, the Reo and the Koehler—who, by the way, are not using many of these standardized components—are, like Ford in passenger cars, concentrating upon single models only, the former on two tons, the latter on one, with price results which are remarkable.

When considering American vehicles, one or two points have to be kept in mind, and of these perhaps the most important is the fact that the American ton contains only 2,000 lbs. as against our 2,240 lbs., so that a "two ton" U. S. truck is only the equivalent in load capacity to less than 36 cwt., and an American six-tonner is very little more than equivalent to our five-ton outfits. One or two firms in the United States are building $2\frac{1}{2}$ and $3\frac{1}{2}$ ton trucks, which may safely be taken as the equivalent of our two and three tonners, but the number is very few, and for the most part the people who are handling U. S. trucks in this country and who, many of them, have very little knowledge of the commercial vehicle industry, are ignoring this very important difference, and are listing their vehicles under their U. S. designations, which is unfair to the British buyer. Some are even going further, for I recently came across one truck, listed by its makers as a "3-4ton" vehicle, which was calmly masquerading as a 5-ton wagon in the hands of the British representative, and was, I believe, being offered to the British War Office as such!

Another characteristic feature of American trucks is the fact that the steering gear is arranged on the left-hand side of the car. Until two years since it was the other way about. Last year about 20 per cent. had changed over, and this season, with scarcely an exception, all U. S. trucks are left-handed vehicles, an arrangement which, correct enough for the American rule of the road, is, of course, entirely wrong for ours. So far as I have been able to ascertain, the great majority of American truck builders decline to alter this construction for this market, and the cars are being sold over here as left-handed vehicles. There are one or two exceptions to this rule.

Under existing war conditions the high figure at which Atlantic freights now stand is very much against the sale of American trucks, and especially against the sale of the highest class trucks of large load capacity, as from £60 to £100 has to be added to the already high price of these vehicles on that account, and therefore whatever sale these wagons may secure under existing economical conditions, I cannot think that their hold on this market is likely to be permanent, unless production costs and selling prices can be substantially reduced from present figures, as with the British preference for British goods—which preference has been and will be more strengthened by the war—when British makers are once more able to give delivery, few will be found to pay a higher figure for an American article, however good.

On the other hand I am of opinion that whatever hold the "under two ton" U. S. trucks are able to obtain here, they are likely to retain it by reason of the fact that their prices, even after paying the present heavy freights, are substantially lower than for British built vehicles; while, when the war is over, ocean freightage will decline from present figures, and many—indeed most—of them, like the ubiquitous Ford car, are very good value for the money.

WILLYS TO MAKE THOUSAND CARS A DAY

The Willys-Overland Co. will have an output of 600 cars a day at the Toledo plant, by September 1. Within less than one year the company expects to manufacture and ship 1,000 cars every day. The company now has more than 11,000 factory and office employes in Toledo. A night force of 1,500 workmen is laboring to increase the plant's output. The company now is 20,000 cars behind orders received.

The Morrow Mfg. Co., Elmira, N. Y., where Overland parts are made, is to be enlarged immediately by one-third its present size and capacity. The list of more than 2,000 employes will be proportionately extended.

FAVOR LOWER WAGONS

Tests of Department of Agriculture Expects to Get Greater Efficiency

Makers and users of farm wagons are in a fair way to get greater efficiency out of the vehicle that is indispensable to the every-day agriculturist. Such is the perfection of the modern farm wagon that it might appear, at first thought, as though it were folly to suggest that any real improvement could be pointed out in a manifestly good thing that has stood the test of time in all climates, in all seasons and on all sorts of roads. There is something in such argument, too, and so I hasten to explain that the traction experts who are hinting that it may be possible to get even better service out of the average farm wagon are not for a moment proposing that any radical changes be made in the design and construction of the wagons.

It is by what might be termed a refinement of details that it is proposed to attempt to better the performance. To illustrate, it may be cited that the experts have discovered that there is a direct and very important relation between wagon performance and the road surface where operations are carried on and this has resulted in an ambition on the part of these experts to ascertain how to get the most out of a wagon on any given type of road. Similarly, it has been proven that width of tires exert a really surprising influence upon wagon work, hence a desire to evolve a law of tires that will enable the wagon seller and the wagon user to know just what to expect under given circumstances.

Tests by Department of Agriculture

As in so many another agricultural activity that comes close to the interests of the men in the implement trade, it is the United States Department of Agriculture that is making the lead in this effort to get maximum efficiency from the farm wagon. As it happens "Uncle Sam" did not set out with this express purpose in view, although that is perhaps neither here nor there so long as results are attained. At the outset, however, the direct interest of the federal experts was in the problem of good roads and they went into the farm wagon proposition only as a means of proving how much better service may be derived from farm wagons operated on good roads than from the same vehicles similarly used on poor roads. However, the work to this end has disclosed the importance of the farm wagon as an essential of farm-operating equipment and now we find "Uncle Sam" starting to study the farm wagon quite apart from its relations to roads or road conditions.

Although nothing has been said about it until now the Office of Farm Management (which under the new reorganization of the department will be attached directly to the office of the Secretary of Agriculture in order to increase its scope and usefulness) has been busily engaged for some time past in gathering first-hand data relative to farm wagons and their operation.

Lower Wagons Favored

It is entirely possible that the disclosures to be made by the federal experts, backed up by a formidable array of figures, may result in one modification of American standard farm wagon design, namely a lowering of the bed with the consequent use of smaller wheels. The experts who are studying this subject for the government are tremendously impressed with the economies of the low bed wagon which they declare conserves to the farmer a tremendous amount of time and energy because it is not necessary to lift potatoes or other commodities so high in loading the wagon nor is it required to lower them so far in unloading. Many men in the wagon trade may be inclined to regard as visionary in the extreme so radical a change in wagon design but the fact remains that wagons and carts with beds at a low level have been in use for years by the thrifty farmers in foreign countries and vehicles with the beds elevated no farther above the ground than is absolutely necessary have come into extensive use in sections of New England, to which territory a field agent of the Department of

Agriculture has recently been sent for the express purpose of making a special study of these "close to the soil" burden bearers. Advocates, in the department, of these easily loaded wagons do not, it is understood, advocate any change in the structural features of the farm wagon and that the change is not as radical as the altered appearance of the wagon would suggest is attested by the fact that in New England many farmers have, unaided or merely with the assistance of a local blacksmith, lowered the beds of regulation farm wagons.

Effect of Tire Width

Whatever effect width of tires, etc., have upon the efficiency of the farm wagon will be disclosed scientifically for the first time as the result of an exhaustive series of traction tests which are being conducted by the Office of Rural Engineering of the Department of Agriculture. These tests have been in progress for some time past and are to be pushed even more energetically in the future with the aid of a specially equipped wagon. That local conditions in widely separated sections of the country are being taken into account in these studies is indicated by the fact that tests have already been conducted or soon will be in Fairfax county, Va.; Boone, Story and Dubuque counties, Ia.; Aiken county, S. C., and at various points in Ohio, Maine, Kentucky, Maryland and Texas. Tests made in Kansas and Tennessee were planned especially in order to afford deductions as to the influence of width of tire upon farm wagon efficiency and these tire tests included hauls over all types of roads—dirt, gravel, macadam, etc., as well as runs on different types of pavement in order to get a bead on the performance of the farm wagon under the conditions that confront the average farmer when he comes "to town" or hauls his produce to market.

That the wagon work thus far done by the government has merely "scratched the surface" and that an outcome wide in scope and of far-reaching importance to the wagon trade may ultimately be expected is evidenced by the fact that the investigations as to the effect of the width of tire and the influence of road conditions upon farm haulage constitute but two of a number of angles from which the subject will be approached. Later the experts will take up such factors as the relation of the weight of the team of horses or mules to wagon efficiency, the effect of grade and of continuous operations and even the methods of hitching and adjusting harness.

Origin of Plan

It may be interesting to note that the present studies and investigations with respect to farm wagons are the direct outgrowth of an investigation that originally dealt with the pulling power, etc., of farm tractors. From the one subject the federal experts graduated to the other and in the end E. B. McCormick, mechanical engineer of the Office of Public Roads and Rural Engineering, devised special recording apparatus for chronicling the results of the tests. Mr. McCormick, who has general charge of the wagon tests, although he is not able to accompany the wagon to all parts of the country where trials are made, was moved to invent what is known as the McCormick traction dynamometer because there was not to be found on the market any commercial instrument that will do what the traction experts wanted and what is accomplished by Engineer McCormick's special apparatus. The initial dynamometer thus originated is suspended from the bed of the standard wagon or dray which was selected for the government tests but within the past few weeks Mr. McCormick has perfected a modification of this apparatus which is to be used on an automobile which will serve as a means of making tests on all sorts of country roads where motor cars are in service. Incidentally, this latest equipment is going to be the means of showing just how much harm or how much good automobile traffic does to the various different types of road surface.

In the operation of "Uncle Sam's" test wagon the entire draft applied to the tongue is transmitted through coil springs which enables it to be measured, owing to the compression on these springs, by the dynamometer. The pull is transmitted by a

shaft, rack and pinion to a band wheel carrying a pencil motion and under this pencil, which is simply a brass point, a platen and a series of feed rolls carry a strip of metallic-surfaced paper ten inches in width whereon the performance of the wagon is recorded to the tune of a one-inch pencil stroke for each 500 pounds of pull exerted. A timing device operates in connection with the dynamometer and mounted on the bed of the wagon between the two rear wheels is a gradometer which interprets the effect of grades of varying degrees of steepness upon the operation of a farm wagon.

Variation in Cost Due to Conditions

The apparatus devised by the government officials, says Waldron Fawcett, in *Farm Implement News*, will make it possible for the first time to translate into terms of dollars and cents the differences in the various conditions affecting the operation of farm wagons. Every person has known, for instance, that bigger loads could be hauled on a hard-surfaced road free from excessive grades than could be moved on a poor and hilly road but until this equipment was evolved there was no way of accurately computing the monetary saving to the farmer in operating costs, wear and tear upon his wagon, expenses for repairs, etc., etc.

For the purpose of settling, if possible, the mooted question of what width of tire is best for a farm wagon under given conditions, "Uncle Sam's" try-out wagon is provided with eight sets of wheels, readily interchangeable, of course, and fitted with tires ranging from one and five-eighths inches to six inches in width. In order to make deductions with respect to the effectiveness of different tires and other issues involved the government wagon is operated not once or twice but dozens and scores of times over the same stretch of roadway. Incidentally, it may be explained that whereas the recording apparatus on the wagon is adjusted in contemplation of the operation of the wagon by horses or mules it can be adjusted to permit of the wagon being drawn by a gas tractor and this has been done in tests made in Iowa and elsewhere. Likewise is it possible by adjustment of the dynamometer to secure a record of the draft required to haul one or more pieces of farm machinery hitched behind the wagon. In such tests the draft shown is that required to haul the supplementary load and no record is taken of the draft required for the wagon.

In making local wagon tests the government engineer, if he finds that one width of tire is in almost universal use in that section for gross loads of two tons or more, is likely to confine himself to that width, provided opportunity is to be given to try out but one width of tire, but whenever it is at all possible, that is, whenever time will permit, tests are made with all of the eight different widths of tires. With each tire used a graphic record is made of the distances traveled, of the draft required for the entire route and of the time consumed in making the test. The government wagon while usually hauled by two horses has in some instances required four horses owing to road conditions, etc.

In conclusion it may be noted that one ultimate result of the investigation now in progress by the Office of Farm Management is expected to enable accurate, scientific information as to the number and capacity of the farm wagons required to attain the greatest efficiency in the operation of a farm of any given size and character. Likewise one result of the traction tests by the Office of Public Roads and Rural Engineering will probably be an array of facts and figures calculated to enable an implement dealer or a farmer to decide intelligently whether farm wagons or tractors or motor trucks would be best calculated to give economical and efficient service under given conditions.

VEHICLE LEAGUE'S ANNUAL OUTING

The third annual meeting of the Vehicle League was held at Old Point Comfort, Va., on June 9 and 10.

Yearly reports were read from the president, the secretary and treasurer, the governing board and the commissioner, all of which indicated a satisfactory year's work.

The main object of this thriving association is the conduct of a mutual credit information exchange bureau and the splendid results already accomplished justify its continued existence. There are over 30 active members of this association, mostly southern buggy manufacturers. The wagon and harness manufacturers are eligible to membership and a few of the most enterprising have availed themselves of the benefits to be derived from this up-to-date method of safeguarding credits. A campaign is now on for new members and with the additional number that are expected to join, the price of the service has been reduced to a flat fee of \$100 annually besides the \$10 yearly membership fee to defray expenses of the administration.

The commissioner's report indicated a large scope of work accomplished during the year—a year of very unusual hardships and discouragements for the average manufacturer. But from the fact that a resolution passed unanimously complimenting the work of the commissioner and the reelection for the third year of the same officers and governing board, it can be readily seen that the organization receives the hearty endorsement of the members.

Better co-operation on the part of all members was urged that the service may arrive at the ideal degree of efficiency that is possible for the betterment of the vehicle industry.

In discussing the present phase of the buggy business in this country the meeting was favored by spicy business talks from several members and also by Mr. C. O. Wrenn, president of the C. B. N. A., and Mr. Roninger, Mr. Luth, Mr. Sears, of the National executive committee, who were present. The consensus of opinion was that there would still be good business for those who stay in the game, though not on such a large scale as heretofore.

It was clearly brought out that the automobile is fast finding its legitimate place as a shockingly expensive luxury. The possession of a car is now considered not an asset, but a liability. The horse-drawn vehicle industry must still be held as basic by the conservative business world.

The bad effect of the European war on business generally and in the cotton growing belt in particular, is well known and the south is to be congratulated on pulling through one of the most critical periods in the past 50 years with as little financial demoralization as actually occurred. Her business men are now looking far to the future to try and prevent a recurrence of conditions such as existed last fall when cotton was without a market even at 6 cents a pound. The present widespread complaints caused by the interfering with the movement of cotton to neutral countries by Great Britain and the dire results that are likely to follow this fall, came in for a good share of attention and members were requested to appeal to their Congressmen and Senators to bring pressure to bear on the State Department at Washington that this state of affairs may be speedily corrected.

The Southern Wagon Manufacturers' Association held their meeting at the same time and place. Many accessory representatives and ladies were present.

The social gatherings were most pleasant, the weather fine and the tug boat excursion over to the navy yards and about the harbor on Thursday provided by the Norfolk Chamber of Commerce and the courtesy of the A. C. L. Railway Co., were most enjoyable.

FIRESTONE ADDS FIVE NEW BUILDINGS

The Firestone Tire & Rubber Co., Akron, O., have recently placed contracts calling for the immediate extension of three of the big main wings, plus the doubling of a six-story separate factory building and the erection of a Firestone restaurant. This latter building will be three stories and a basement high, and will be about 150 feet square with a floor space of about 90,000 square feet.

These new additions will add 302,000 square feet of floor space to the present factory and will enable the Firestone people to nearly double their output.

Paint Shop

PAINTING A ONCE NATURAL WOOD FINISHED JOB, AND SOME HINTS ON SCRAPING

Mostly when a job that was once a nice natural wood finish has reached the stage where about all that can be done with it is to paint it, it will be found to be in bad shape all the way through. In some cases all the evidence of its former glory is an irregular patchwork of bare wood and varnish spots on panels; wheels and gear almost invariably bare.

This is especially its condition, if, originally, it was a cheap job on which a hard, quick drying, resinous varnish had been used.

A job of this kind is common. Beyond the removal of mud, by means of a stiff brush or otherwise, it needs no cleaning up. Do not wet it; the chances are felloes and spoke ends are water logged already. Get it dried out as quickly and as thoroughly as possible.

Unhang it so as to get free access to every part, and in many cases it will be found that No. 2 sandpaper will reach bare wood all over.

If anything of a durable as well as a nice looking job is wanted, see to it that not a patch of the old material remains. Do reach bare wood, and sand it so that all roughness is removed. Give the sandpapering more attention than it usually gets, and the subsequent coatings will not only give you finer and more durable results, but in many cases it will be found that an undercoat can be dispensed with over a well prepared surface and still get a good, if not a better finish.

Where the job has not reached such a dilapidated condition, whether owing to its being a better grade of work, and its surface consequently made and finished with better materials and greater care, we must call in the aid of the scraper. A good scraper for panel and flat work is made from an old broad file, one end of which is drawn down to nearly a knife edge, and then turned over about an inch and a half from its end somewhat like a hoe, the remainder of the file becoming a handle, and it will be found that near the hoe end something of a curve should be given to it, the exact amount of curve being a matter of individual preference. Two such scrapers are handy things to have.

One of them, made as above, so as to have a considerable length of straight file, not only as a handle, but this same handle is a very effective tool, using its edges on the insides of felloes between spokes.

Let the other one be turned over hoe fashion at each end, one end turned upwards and one down, and get a curve put in between, that will allow you to hold the tool in a natural position. For scraping spokes there is no better tool than an old discarded drawshave; it already has enough knife edge bevel, what is necessary to make it "the best thing out" is to put its edge on the grindstone and make it level. Get a square edge on it, nearly a sixteenth of an inch wide, so there will be no danger of cutting with it. To use it, stand up facing the tire, let the wheel rest on the floor for steadiness and you can do rapid and effective work with it. From this position, too, the insides of felloes may be done at the same time, with the same tool. Any number of coats of paint will give way at one stroke to this scraper. Be sure that all scrapers have true and level edges and keep them so, they can be made so either on the grindstone or on the emery wheel, which is now mostly found in every shop. In default of an emery wheel, get the edges true on a grindstone, then keep them true with a new and good sized saw file. The saw file is not equal to the emery wheel, and where much scraping has to be done the use of a saw file

will soon cost, in time wasted, the price of a good emery grinder. The drawshave will clean the spokes from end to end, beginning at the hub, and finishing at the felloes. On the hub itself, in between the spokes, the end of the scraper that is straight handled may be made just the width to go in between, and if the scraper is made from a blacksmith's (horseshoer's) rasp, the cutting teeth on its edge will do perfect work there. Reach bare wood everywhere. Don't spoil the scraper edges on iron, any old file will clean that. Notice that in these jobs the under parts of springs, axles, etc., are mostly a mass of "painter's tears." Clean them off. The varnish was literally poured on to make a show, and in the case of the cheap job probably no attempt was made to wipe up. Having all scraped clean, sand thoroughly.

No man can do too good sandpapering. As to paint and varnish removers, there are many concoctions, and under many fancy names.

There is really only one use for them in the carriage paint shop, and that is in carved work where all is so difficult of access that the surrounding parts are liable to get scorched when burning off, and a scraper cannot be made effective with economy. After sanding, the cleaning off of such a job, so as to remove all dust, is no child's play, merely dusting won't do it. Keep an old duster handy when sanding and clean off the rough as you go. Dust afterwards with a good duster, then moisten a piece of cheesecloth with a little raw oil and turps, about half and half, and pass over the surface to collect the finer dust.

A dry cloth could be made to do, but it will not pick up the fine dust in the same way that the moistened cloth will, and there is always falling from it some that has been removed, and an inadvertent shake may undo much good. Better moisten it. The next thing in order is to renew the priming. What has been said previously about priming over a burned off surface holds good here, though not quite to the same extent, because in scraping you will actually now and then get so deep that the original priming is interfered with. Let the priming get thoroughly dry and hard, then sand lightly with No. ½ paper, clean up well, and apply a lead coat. This lead coat, if shop mixed, should be made of the best keg lead obtainable, thinned and beaten up with a mixture of ¾ turpentine to ¼ raw linseed oil, and when mixed, have added good coach japan not over one-half a teaspoonful to a full pint of the mixture. This should be given some hours to assimilate, overnight is just about right, before using.

In calling attention to the necessity for time to assimilate, allow me to say here, that the painter today, intent on getting the biggest returns for his work, does not fool away valuable time shopmixing undercoats. He can buy them ready to thin up and put a brush in. These goods save time, are always uniform and reliable, and as nearly as possible all chance of waste is eliminated, they dry more reliably than any hastily made up shop mixture can, and allow of the work being put through in the least possible time that good work can be done in. If you don't know about them already, you ought to find out. By asking I think you will find that you can get everything needed—even putty—better made and of more suitable materials to conform to speed limit and durability than can be found "just anywhere." Naturally, they cost a little more than the common keg lead does, but really not more than the lead, oil, turps, and japan, and it's fair to say that all time spent shop mixing in the old way is time wasted, and time is the costliest thing in this business.

I don't doubt it could be proven that by the use of these

goods, as compared with wasted time and poor materials in shop mixing, the difference would be such that the manufacturers could claim their undercoats cost nothing.

Whatever is used see that it goes on level and free from brush marks. This lead coat is the first that should go on the ironwork. Never put an oily priming on ironwork; it cannot absorb it in the way the porous wood does, and it will prevent the nice finish you might otherwise get. On this lead coat one can putty the morning following its application, and the day following the body will be ready for its first coat of roughstuff.

The number of coats of roughstuff will depend upon the kind of finish you aim at and can get pay for. The gear being hard and dry must proceed according to price. It could be colored and finished over what it already has, but preferably the rims of wheels at least should be draw puttied so level that they need no sanding, then a coat of flat lead applied with a camel hair brush, sanded smooth, and finish as usual.

MODEL PAINT LAW

For the last 20 years various laws have been enacted in many of the states, having for their object the prevention of the sale of adulterated paints. Some of these required the disclosure of formulae of the paint contained within the package, and these naturally caused a great deal of dissatisfaction among manufacturers, while they effected but little practical good. The state of Colorado has enacted a law which became effective on July 14, and which appears to be admirable. It does not require formulas, but does prohibit false or deceptive branding. The following are the salient features, as given by the American Paint and Oil Dealer:

Whoever shall expose for sale or sell within this state, any paint, varnish filler or stain which is labeled or marked in any manner so as to tend to deceive the purchaser as to its nature or composition, or which is not accurately labeled, shall be guilty of a misdemeanor and shall be subject to the fines and penalties as hereinbefore provided.

The label required by this act shall clearly and distinctly state the name and residence of the manufacturer of the paint, varnish, filler or stain, or the distributor thereof, or of the party for whom the same is manufactured; said label to clearly state in addition to the beforementioned matter, the quantity contained in the package; this in the case of liquid or mixed paints, varnishes, fillers or stains to be designated in United States standard gallons or fractions thereof. In case of paste or semi-paste paints, such as are commonly sold by weight, to be shown by weight avoirdupois. Such label shall be printed in the English language in plain, legible type.

The term "paint" as used in this act shall include white lead, basic carbonate or sublimed, in any kind of oil; or any compound intended for the same use, paste or semi-paste, and liquid or mixed paint ready for use.

No person, firm or corporation, or agent or employe of any person, firm or corporation, shall manufacture for sale, or offer or expose for sale in this state, any flaxseed or linseed oil unless the same complies in all respects with the standard specifications for purity of raw linseed oil from North American seed, adopted August 25, 1913, by the American Society for Testing Materials, or any flaxseed or linseed oil as "boiled linseed oil" unless the same shall have been put in its manufacture to a temperature of 225 degrees fahrenheit.

No person * * * shall sell or expose or offer for sale, any flaxseed or linseed oil unless it is done under its true name and each tank car, tank, barrel, keg or any vessel of such oil has distinctly and durably painted, stamped, stenciled or labeled thereon the true name of such oil, and in ordinary bold-faced capital letters the words: "Pure Linseed Oil Raw" or "Pure Linseed Oil Boiled" and the name and address of the manufacturer or seller thereof, and sold under the brand of such manufacturer or seller.

No person * * * shall manufacture, mix for sale, sell or offer for sale, for any further than medical purposes, under the name of "Turpentine" or under a name composed of a part

or parts of the word "Turpentine," any article which is not wholly distilled from rosin, turpentine gum or scrape from pine trees, and unmixed and unadulterated with oil, benzine or other foreign substance of any kind whatever, unless the package containing the same shall be plainly stenciled or marked "Adulterated Turpentine," except turpentine produced from turpentine gum extracted wholly from pine wood, which turpentine is known as "Wood Turpentine." When such wood turpentine is mixed and adulterated with oil, benzine or other foreign substance of any kind whatsoever, the container shall be plainly stenciled or marked "Adulterated Wood Turpentine." * * * Nothing herein contained shall be construed to prohibit the manufacture or sale of any compound or imitation, providing the container shall be plainly marked and the purchaser notified as aforesaid.

Paint Contracts—Any person, firm, or corporation, entering into any contract or agreement to paint any building or structure shall be deemed to have agreed to use pure linseed oils, turpentine and pigment, complying in all respects with this act, unless he shall give notice to the contrary in writing before entering into said contract or agreement.

"LEAD POISONING"

A new book, by Sir Thomas Oliver, M.A., M.D., F.R.C.P., London, Eng., has just been published by H. K. Lewis, 136 Gower street, W. C. The new book treats the subject from the industrial, medical and social viewpoints. Aside from the subject proper, various side issues are considered. As an example the comparison of different processes of white lead manufacture are of interest. In comparing, he says:

Opinions differ as to the relative values of white lead manufactured by the Dutch method (14 weeks), and that by the Chamber process (eight weeks). Regarded from the hygienic point of view, the Chamber process is cleaner, time is saved in the corrosion, more of the metal is said to be corroded, and there is a saving of labor in filling and emptying the chambers. Mr. Noel Heaton considers chamber white lead to be brighter in color, probably owing to the absence of tan influence, to be finer in the stain and more uniform, but many master painters with whom I have discussed the question, prefer white lead made by the Dutch process. That the material thus produced must possess the good qualities ascribed by them to it, is shown by the fact that the Dutch process still remains in many factories the sole method of making white lead. Nay, more than this: of the 275,000 tons of white lead produced by various processes, the approximate quantities given by Klein are:

	Tons
Stack, i. e., Dutch process.....	180 000
Chamber	45,000
Miscellaneous	50,000

In Great Britain it is estimated that 70 per cent. of the white lead is manufactured by the Dutch process, and in the United States, 80 per cent. Estimating the total production of white lead in the world to be 275,000 tons, it is interesting to see how the various countries contribute to it:

	English tons dry
United States	120,000
Great Britain	55,000
Germany	36,500
France	20,000
Belgium	15,000
Russia	14 500
Italy	4,500
Holland	2,500
Spain	2,500
Canada	2,500

Concerning the extent of lead poisoning, the author makes the following statement:

In Great Britain it is difficult to estimate the amount of lead poisoning in painters, owing to notification of plumbism being voluntary, also to the fact that house and ship painting do not come within the Factory Act. The figures received under voluntary notification show lead poisoning to be even more prevalent among painters than was expected, also that it is increasing.

These remarks apply equally to painters in Germany, France, Austria and the United States. Painters have a higher mortality than the general population. In Berlin, in 1903, the general death rate per 1,000 inhabitants was 11.61, but for painters it was 14. Fleck gives as the mortality rates of German painters, 1.3 per cent. from lead poisoning; nervous diseases, 7.8 per cent.; heart, kidney and liver disease, 20.8 per cent. Figures taken from the Prudential Insurance Co. of America show the deaths from the same causes to be 1.5, 10.7 and 35.9 per cent. respectively. Among German painters diseases of the respiratory organs caused 41.6 per cent. of deaths, and in the United States 26.3 per cent.

Taking all the paint industries—and in these are included house, coach, ship and automobile painting—the cases of plumbism reported to the Home Office were 154 cases, with 4 deaths, in 1908; 197 cases, with 9 deaths, in 1909; 159 cases, with 12 deaths, in 1910; 316 cases, with 12 deaths, in 1911; and 204 cases, with 12 deaths, in 1912. Coach painting furnishes the largest number of cases of plumbism.

Between 1900 and 1909 there were reported to the Home Office 1,973 cases of lead poisoning, with 380 deaths, of house painters. In the tables furnished by Dr. Legge one important fact stands out, and that is the large amount of paralysis among the men. Tancquerel des Planches found the percentage of paralysis in lead poisoned French house painters to be 8, and Teleky 14.5 in Austrian painters. During the period above mentioned the British tables show the percentage to be 22.7. Teleky distinguishes between painters employed on the outside of buildings and those employed in decorating rooms. Of 100 painters of the interior of houses, 31.2 of the men were off ill annually—0.7 from lead poisoning and 3.4 from tuberculosis; while, of 100 painters employed on outside work, 47.4 of the men were off ill annually—7.7 from plumbism and 4.3 from tuberculosis. If the figures for Berlin are taken there were, between 1900 and 1909, on an average, 376 men off ill per year; if 100 members only are considered, 46.9 men were off ill per year—8.11 of these from plumbism. The smaller number of cases of lead poisoning among the Vienna painters who were employed on inside work is to be explained by the circumstance that other metals than lead were being used in the paint; for if similar lead paint had been used internally as externally the cases would have been more numerous. That is the conclusion we come to from the following: In Vienna, for internal painting, there were used annually 1,600 hundred weights of white lead. This amount of material caused 163 cases of lead poisoning. For outside painting, 4,750 hundred weights were used, and this gave rise to 50 cases of lead poisoning.

In the United States it was found that 1 in every 6 painters, and in Austria 1 in 4, gave a history of having had plumbism in one or other of its minor forms; but, bearing in mind what has been stated in the preceding pages regarding the increase in the number of drying agents now used, it is more than probable that part of the illness the men suffered from was of the nature of an intoxication from turpentine and its congeners, or from carbon monoxide, as suggested by Gardner, rather than lead; for if there is one circumstance peculiar to the plumbism of painters, it is that, owing to the gradual absorption of lead, the malady develops slowly, and is usually associated with some such lesion of the nervous system as paralysis or with implication of the kidneys. It is seldom that a painter dies from uncomplicated and acute lead poisoning.

Among the common complaints of painters may be mentioned constipation and headache. Some writers state that 50 per cent. of the men suffer thus. This is, I think, pitching the number too high. House, ship and coach painters are credited with a large number of ailments, of which the following may be mentioned:

Colic, ringing noises in the ears, vertigo, rheumatic pains, nocturnal micturition, disagreeable taste in the mouth, disordered sensations, imperfect vision, epistaxis, loss of appetite, sleeplessness, diarrhoea, tremors, gout and depression of spirits.

The book forms a most satisfactory treatise on the subject,

and it covers the matter completely in a practical, scientific manner.

CHINESE WOOD OIL TREE IN FLORIDA A SUCCESS

The adaptability of the Chinese wood-oil tree for cultivation in northern Florida seems to have been proven by recent experiments. A tree at Tallahassee, Fla., bore two bushels of the fruit last season. In addition to being an economically important tree, it is a decidedly ornamental one. It bears clusters of white flowers with reddish-yellow centers, and in full bloom resembles a catalpa.

The United States imports annually about 5,000,000 gallons of Chinese wood oil, valued at \$2,000,000. As the demands of the American varnish trade are steadily increasing this affords a very large domestic market for this prospective new Florida industry.

The tree is *Aleurites cordata* (Chinese tung yu), the seeds yielding the nut from which the oil is extracted.

AMERICAN WOODS FOR THE WAR

A London visitor among Chicago lumbermen represents the British government as purchaser of certain woods for export to supply the war department. He came to America in April on the *Lusitania*. His principal business in this country is to procure walnut for gunstocks and other woods for aeroplanes. The available supply of European walnut is exhausted and American black walnut must now meet the demand. This wood is not only supplying the British gunstocks, but it is the principal wood now in use for aeroplane propellers.

That important use of black walnut is the latest, and it is likely to be a large one if the war continues to spread and is continued long. The wood is not so strong as some others, including hickory and maple, but it is probably stronger, weight for weight, than any other wood suitable for propellers. In building aircraft the elimination of weight is an important consideration, but lightness must not be secured at the expense of strength. Walnut is also a highly elastic wood, and that quality is needed in a propeller, which must run at high speed and under enormous strain while transmitting perhaps 100 h.p. from the engine to the air.

Still another quality is peculiarly valuable in the exacting service which an aeroplane must do. Walnut does not splinter when struck. If it breaks at all, it breaks clean. That quality comes in good play when a warplane is under fire. Bullets are likely to strike every part of it. The propeller is particularly vulnerable, because it cannot be protected by armor or any other device, but is a shining mark for every bullet aimed. If struck, the bullet passes through, leaving only a small hole; but if the propeller is of wood liable to split and splinter, a bullet might tear away a piece of sufficient size to cripple the machine.

Walnut, after being well seasoned, has little disposition to shrink and swell. The propeller is exposed to rain, snow, fog and dampness of every kind, but walnut holds its form and runs true.

American ash, hickory and spruce are the chief woods in the frames of British aeroplanes. Hickory goes across the sea in the form of long logs, straight and faultless. Those now being shipped for the British war department cost \$60 a 1,000 feet on this side, and the freight across the sea costs \$100 more. The freight is thus seen to amount to much more than the hickory costs in New York; but so urgent is the need that the British government willingly pays the freight. Once again hickory is proving its right to the name "indispensable wood." The quality which is required for aeroplane work is about the same as is used for sucker rods in pumping deep oil wells; that is, the best hickory that grows in the American forests.

The ash used is of a correspondingly high grade, and like hickory it serves as frame material, forming the skeleton over which the canvas is stretched.

Still another wood ranks remarkably high in aeroplane work. The British call it silver spruce, but it is the West Virginia red spruce. For aeroplanes it has been pronounced superior to every other spruce of the known world, even going above the gigantic Sitka spruce of the northern Pacific coast.

The typical West Virginia spruce grows in thin ground, often upon vast beds of broken stone covered with moss, and with scarcely any visible soil. The best is found at altitudes of 3 500 to 4,500 feet on the mountains surrounding the interlocking sources of the Potomac, Kanawha and Monongahela rivers. The growth is slow, the tree trunks as straight as plummets, and with limbs only at the extreme tops. The wood is straight grained and remarkably free from knots and other imperfections.—Hardwood Record.

ABOUT A WOODWORKING SHOP

James F. Hobart, M.E., not very long ago visited a carriage woodworking shop, and his inspection resulted in a somewhat lengthy discourse on shop arrangement and layout. For the benefit of those of our readers who operate woodworking plants we are giving here the gist of Mr. Hobart's remarks, which appeared in a recent issue of the *Blacksmith and Wheelwright*:

Don't locate a machine where it is always in the way. A machine improperly located cannot only be in the way of everything and everybody, but that machine may even be in the way of itself. Therefore, plan the location of each machine very carefully before you put it in position. It is best to make a drawing of the shop floor. Make it to scale, and show each post or other obstruction in the exact place where it is located. Make the measurements very accurately. Don't guess at them. Measure each point in two directions, then lay it down closely on the plan, and you will have a drawing of the shop floor which will be valuable. Show all windows, also the doors, and mark those through which stock should enter and leave.

Next, make floor plans of each machine, also to same scale, and show the feed-in and feed-out sides of each machine, also show the drive pulleys and other important projections from the machine, which will take up or require floor space. Make the drawings of the machines upon different colored paper, then cut them out, and place on the floor plan of shop in positions where you think they would be best located.

Don't throw the machines upon the floor haphazard. Place them in accordance with some well devised plan of progress through the shop, so that stock will come in at one point and leave the shop at another, and will have as straight a passage as possible through the shop from machine to machine, until the required work is done.

Don't arrange machines in such a manner that the work must follow a zigzag path through the shop or have to be moved back and forth from one side of the shop to the other. This is poor management. Costly, too. Don't do it, for you never can machine stock as cheaply as where it follows in a straight line to one machine after another until all operations are finished. When you have found the best possible arrangement of the machines, then paste the colored drawings in place on the plan, and don't depart therefrom when locating the machines in the shop. Make the plan to suit the conditions in the best possible manner, then stick to it and you will have a good and well ordered shop as a result of following the plans as they were made.

Don't use the fingers for removing very small pieces which are close to a circular saw. Use a stick. Every well regulated shop will have a push stick as part of the equipment of each saw bench. A push stick, cut to a shape which fits easily and naturally into the hand, should be doped out, then saw out a bunch of them on the band saw and bore a hole in each by means of which the push stick may be hung up, out of the way, when not in use. Don't hang the push stick upon a wire nail. Nails are abominable for hanging things on. There is always a lot of time lost in lifting the article off over the nail head, or in puzzling around to get the nail head through the hole when hanging the thing up again.

Mr. Hobart also has something to say about grinding circular saws and overhauling planers. What he says is of interest and value to those who are contemplating an overhaul or clean up.

There are carborundum grinding machines to be had in open market which make it unnecessary to use a file upon circular saws. The grinding machine will do it all—keep the saw sharp, the teeth in perfect shape, "filed" at exactly the right shape and angle, and the gullets all nicely gummed so the sawdust can have plenty of room to get out of the cut and not be jammed in so tightly that it cannot get out from between the saw teeth.

Don't buy expensive files for your saws. Use a cheaper emery wheel, either emery, "carborundum" or "arborundum," and save time, money and saws.

"How's That Planer?"

When did you overhaul that planer last? Has it been really cleaned since you bought it new, ten years ago? Have you looked it over at least once a year to see that the bed is level, the pressure bar straight, the chip breaker sharp and clean?

The cutter-head should run between 4,000 and 5,000 revolutions per minute. Are you running it at that speed? And have you kept the journal bearings clean and in good shape, the felts clean and free from worn-off babbit metal flakes? How long since you had the cylinder head out of the bearings and looked them over? What! Not for three years? Shame! No wonder that planer absorbs 14 to 16 h.p., and the journals run so hot that you have to keep shutting down to let them cool off.

Take a couple of days off and overhaul that planing machine. Strip it right down to the bare bed. Take off everything and look to the journals of each and every roll. Get a lead or copper hammer and tap each section of the sectional feed roll and see that each section is free from the adjacent sections, and that it comes right back into place when struck with the lead hammer (a wooden mallet will do if you don't have a hammer of lead, and failing to find either, test each section with a small block, striking the block with a hammer).

I took down a planer the other day, which, I was told, had been run for seven years without overhauling—without even cleaning! And I think they told me the truth, for it took a man about two hours, with broom, brush and scraper to find that planer in the pile of grease and sawdust which had accumulated about it.

Everything having been stripped down, the raising and lowering mechanism of the bed was examined. This planer used a sliding wedge for that purpose and the table was blocked upon four sticks, one placed under each corner upon the frame, when the table was fully raised, then the wedge was moved forward until there was nearly a foot space between wedge and table. The slides were cleaned and oiled, the bottom slides cleaned and all were examined but there had been no appreciable wear, owing to the very long bearing surfaces, therefore a little graphite was dusted upon the slides, they were run back again, the sticks removed and that part of the machine was ready.

The journals of the cylinder or cutter-head were then looked after, and they were found in pretty good condition. They showed signs of overheating, but were not cut or abraded, and were straight and smooth. A couple of centers were rigged up, the head placed between them and rotated by hand, while a test was made with a bit of chalk to find if the head was sprung in any place, but luckily it was straight and in first class condition.

Next, the journal bearings were looked to and here trouble was found! The main bearings were oiled by four felt wicks which were slipped into holes in the bearing-cap, and the outer ends dipped into an oil well. To prevent the waste of oil—supposedly—the workmen would remove those wicks when the planer was not running, replacing the wicks when it was started up, leaving the wicks in the oil wells meanwhile.

As a natural result, somebody had a little work to do, and did it without troubling to put the wicks in place. Then another man did a job without remembering to adjust the wicks. And

pretty soon it was found too much work to put eight wicks in place before starting the planer, therefore two wicks in each bearing were used, the others left in bottom of the oil wells.

As a natural result of this treatment, the bearings got dry and a lot of the babbitt was flaked off and deposited over and above the piece of felt in an oil groove in the bottom of each bearing. The felt in the bearing next to the belt, was completely plated over and you could find no wick at all without digging into the bottom of the bearing for it! Two belts, one at either end of the head, were furnished, but only one had been used on account of the second belt being badly in the way when working around the planer; that belt was left off and the 24-inch cutter head was run at 4,300 per, with one belt, hence the great wear at the bearing next to that belt.

All the flaked babbitt was scraped out, the wick was exhumed and found almost metalized, and some charred, and it was replaced by a new wick. The babbitt, aside from the flaking, seemed in good condition, and we did not run new bearings, but that will be necessary the next time the planer is overhauled, for the cutter head was found to be lower at one end than the other, necessitating some paper packing under one end of the bed-piece. And the wear brought the head so low that when the top, smooth pressure roll was lowered to correspond, it was all I could do to get the feed driving gear into place. As it was, the gears bottomed, but as the roll would raise a little when a board passed under, it would work all right until more wear developed in the main bearings, when the roll could be raised to agree with new cutter-head bearings.

There were no straightedges in the shop, to use on this planer, so I procured a piece of cold rolled steel, $\frac{3}{4} \times 1\frac{1}{2}$ inch and about five feet long. This piece was sawn in two in the middle, and a $\frac{1}{8}$ inch hole drilled close to one end of each piece, for hanging up the pieces when not in use. While these straightedges were not strictly exact, they were close enough for making the planer adjustments and were kept afterwards for that purpose, being hung in the foreman's closet for safe-keeping.

The cast iron bed of this planer was made in three pieces, one at either end, the other immediately below the cutter-head and between the feed rolls. The two end pieces needed nothing done to them. The middle piece was taken out, cleaned thoroughly and tested with the two straightedges, placing one across at either end and then "sighting" across the straightedges to see if the section of bed was "out of wind"—which it was, and nothing had to be done with it in that direction.

But when a straightedge was placed lengthwise of the bed section—the straightedge would have been crosswise the planer, had the bed section been in place—then it was found that the bed section was badly worn in the middle and was more than $\frac{1}{32}$ inch below the straightedge at that point. Some flat steel "feelers" were used for testing the distance beneath the straightedge. These "feelers" come, several in a bunch, mounted in handles like jack-knife blades, and of many and varying thicknesses. You can get this instrument from a tool dealer, and it is very handy and useful around the wood shop.

The nearest machine shop was some distance away, so it was determined to dress the bed plate by hand. An 18-inch bastard file was procured, and the bed laid upon a bench at the right height for easy filing and the bed plate section was slowly filed down to a level surface. The straightedge was used freely during the filing, and the callipers were also used to keep all four corners of the plate to the same thickness. The workman would file away at a high place, then change the direction of the filings, and by watching the new file marks obliterate the old ones, made at a different angle, the workman was able at all times to tell pretty closely just where and how the file was cutting. It took about six hours steady work to bring the bed section down flat, and it was left "crowning" about a thousandth of an inch, for good measure and for future wear.

Upon putting the bed section in place again, a straightedge was placed along each edge, the cutter head put in place with one flat side downward, then the lower feed rolls were adjusted until they were off the middle bed section the thickness of tissue

paper, then the bed was raised until one of the straightedges was gripped between cutter-head and feed rolls and bed section. It was found that the straightedge at belt end of cutter head was pinched first, then the other ends of the lower feed rolls were raised by their adjusting screws until both straightedges were pinched alike under the cutter heads. Then the planer bed was lowered away down, the bed section removed, and shimmed up with paper until, when the plate was screwed fast in place, it was tissue-paper thickness below the straightedges at either end of the bed.

It was necessary to thus raise one end of the bed section because of the wearing down of the head-bearing as above described, and any more wear of this bearing means the casting of a new lining in each journal bearing.

The knives, to do the work required from this planer, had to be set out but very little past the head—barely $\frac{3}{64}$ inch. The head was then turned cornerwise, with cap-lip at its lower point, and the table raised until the straightedges were $\frac{1}{16}$ inch below the lip in question. Then the upper feed rolls were adjusted, the front roll to barely touch the straightedges, the feed-in, or sectional roll a little lower, so that it gripped the straightedge firmly and showed that the sections upon the straightedge had been raised slightly.

No further fitting was found necessary, save to the chip breaker just front of the corrugated feed roll. This piece was made of sheet steel, about $\frac{14}{100}$ inch thick, and so made that either edge could be used, thus making it reversible. This piece was hollow, more than $\frac{1}{16}$ inch, and one side badly cracked but it was straightened and made to answer until a couple more steel shapes could be obtained from the planer manufacturer. These were ordered to come at once by parcels post.

APPEALS COURT DECIDES AGAINST CADILLAC COMPANY

The decision granted Walter S. Austin, of the Austin Automobile Co., Grand Rapids, Mich., last January, against the Cadillac Motor Car Co., Detroit, for infringement of Austin's two-speed rear axle patents by the Cadillac company in the United States District Court, has been confirmed by the United States Circuit Court of Appeals, Sixth Circuit in Ohio, the court holding that Austin's patent No. 1,091,618 covering a two-speed rear axle construction has been infringed by the Cadillac company in the axle design used on its regular cars during the season of 1914.

It is shown in the review of the case by the court that Cadillac in its negotiations with the Austin company received a two-speed Austin axle which it later returned to the Austin factory and after which time the Cadillac company brought out its own design of two-speed axle, which was used in its cars and which design has been declared an infringement. The court, after minutely describing the Austin axle and the infringing Cadillac axle, declares that while some of the details of design differ yet the basic features are the same and that Cadillac infringes claim No. 10 of the Austin patent.

The Cadillac defense insisted that according to this claim the Austin device referred to an arrangement of bevels, gears and clutching devices in the axle, and that it was limited to this particular method of clutching, but the court held otherwise and decided, "We shall not read into one claim elements which expressly characterize another, by which alone the two substantially differ and which are not necessary to make it operative; and that if Austin's only real invention resided in his peculiar clutch mechanisms claim 10 would be void, because broader than the invention."

This part of the court decision refers to the fact that in the Cadillac design the two pinions on the continuation of the propeller shaft are both mounted on sleeves loose on the shaft but capable of being clutched thereto, whereas in the Austin axle while the arrangement of the pinions is the same the smaller pinion on the rear end of the shaft is solid to the shaft and the forward one capable of being clutched to the shaft.

In this connection the court has held that Austin's patent is broader than one covering any particular type or scheme of clutching and that the inventive feature of his device is in the arrangement of a double pair of bevel pinions and gears, the higher gear ratios being outside in the group and the lower gear ratios inside. In the Cadillac the two large bevels are bolted together, whereas in the Austin axle they are separate gears capable of being separately clutched to the shaft, but yet this difference of detail working out of the scheme does not conflict with the basic features of Austin's claims.

In this connection the court held that Cadillac had a legitimate right to develop any design of two-speed axle, using whatever clutching schemes may be deemed best providing it does not infringe the Austin claim of relative arrangements of the two sets of pinions and bevels coupled with clutching devices.

Austin's Renewal

In referring to that part of the argument between Austin and Cadillac in which Austin was expecting to get broader claims on his axle after it had been shown to the Cadillac company, and the possibility of obtaining such claims was discounted by the Cadillac company, the court holds:

"There is no doubt that Austin at first regarded his relative arrangement of gears and clutches as characteristic of his invention, both according to the specifications and claims allowed on his original invention. The idea of one fixed member and one clutch member upon the shaft and one of each on the axle was inherent in all these. . . . The defendant's device does not infringe these claims. . . . Austin took further counsel, abandoned his application and filed another in renewal and on this new application he secured claim 10. . . . Very likely the necessity for these new claims was brought to Austin's mind by his dealings with Cadillac; and by observing the Cadillac design. . . . Austin's original failure to claim a certain gear arrangement in connection with his clutching scheme, ought not on any principle prevent him from claiming it as soon as the propriety of doing so occurred to him. . . . The fact that this feature (high-gear ratio set of pinion and bevel out of the low-gear ratio set of pinion and bevel) was regarded by Austin as his chief advance and that he so presented it to Cadillac, and that Austin notified Cadillac that he expected to get better claims in this respect."

The amount of damages which Austin will collect, in the event a rehearing is not granted cannot be determined until the usual routine of accounting has been carried out.

GOODRICH HAS NEW TRUCK TIRE POLICY

A new step in the policy of the Goodrich Tire Co., of Akron, O., has been suggested by S. V. Norton, sales manager, for the truck tire department in which the company recommends the use of 5 and 6-inch single solid tires in preference to 3 and 3½-inch duals; but where singles are larger than 7 in., it is more desirable to use 4, 5 and 6-in. duals as the conditions demand.

"Momentary overloading of solid truck tires," says Mr. Norton, "which ruptures the rubber by displacing it beyond the limits of its ability to recuperate, is the cause for more tire failures than probably any other factor.

"Momentary overloading means excessive strain or shock on the tire at certain points, due to the tire being forced to bear in one way or another more load for an instant than it is intended to support. This may be due to road inequalities, or other conditions. The result is the normal displacement and the creation of undue internal friction and heating which is not quickly radiated, so that the tire is damaged beyond repair.

"In the smaller dual sizes those made up of less than 4-inch units neither tire is itself large enough to withstand these momentary loads, such as when one of the singles comprising the dual set, takes the entire load and the other is not touching the ground. A modification of these conditions happens on crowned roads where the curve of the surface places more load on the inner tire than the outer. The net result of this condi-

tion in which the load is alternately shifted from one to the other is a permanent rupture."

Mr. Norton further believes that the best results come from a happy medium and consequently for single tires larger than 7-inch sizes are used, the displacement on tires with a load takes place in such direction that it causes undue internal friction and the generation of heat which is not quickly radiated when the tire section is too large.

Many advantages are advanced for the use of 5 and 6-in. singles in preference to 3 and 3½-in. duals, some of which are as follows: (1) Saving in tire cost. (2) Saving in wheel cost, due to narrower felloe, narrower felloe band, and other changes in wheel design. (3) Saving in unsprung weight of wheel, tire and metal equipment. (4) Saving in applying one tire to the wheel as applying two. (5) Larger tire units will better absorb uneven road surfaces, and better compensate for excessive road crown, thereby keeping the whole tire always in use rather than alternately one tire and the other as is the case with small duals, neither of which is large enough to bear the strain alone. (6) More readily fitted with non-skid chains. (7) Better track-age of rear wheels with front wheels. (8) Greater height of rubber tread, and consequently more cushion and increased life in tires, greater than 3 in., which are ¼ in. lower than regular sections of greater width. (9) Less leverage strain on the axle and bearings, due to the decreased width of wheel tread.

Mr. Norton believes that the schedule of tire ratings now in use which rates duals higher than the equivalent singles is open to criticism and this rating may be altered in the near future. He believes that dual tires cannot possibly have a greater carrying capacity than twice that of a single tire of which it is composed, and hence the error in the existing ratings.

U. S. TIRE PASSES QUARTERLY DIVIDEND

The United States Rubber Co. passed its usual quarterly dividend of 1½ per cent. on common stock this month. There is outstanding \$36,000,000 in common stock, on which dividends have been paid since 1911. In 1911, 1 per cent. dividend was paid; in 1912, 4 per cent., and since 1913, a quarterly dividend of 1½ per cent. Some difficulties were anticipated by stockholders when the stock dropped 13 points recently and at this time it was rumored that the usual dividend might not be forthcoming. Stock quotations dropped somewhat as a result.

The only reasons given by the company for passing the dividend are those contained in a statement from President Samuel P. Colt. He says that the net earnings so far this year are substantially the same as last year, but that the unexpected continuation of the war has made it necessary to maintain an unusually strong financial position, and that the war also makes it necessary to carry a larger supply of crude rubber than would be carried at normal periods.

In connection with the crude rubber situation, it is known that the United States Rubber Co. owns some rubber plantations in Sumatra, and it is rumored in rubber circles that crude has been costing the United States company more than some other companies, no allusion to which, however, is made by President Colt. It is understood that earnings were taken from the quick capital to care for these plantations.

CHATTANOOGA WAGON CO. ELECTS OFFICERS AND DIRECTORS

At the annual meeting of the Chattanooga Wagon Company the following directors were chosen: C. F. Milburn, J. E. Boyeson, F. M. Knapp, J. B. Sizer, H. C. Crumbliss, L. W. Llewellyn, and J. G. Thomison. The position of secretary, held heretofore by W. J. Bass, was combined with that of treasurer and the following officers elected: President, C. F. Milburn; vice-president, F. M. Knapp; secretary and treasurer, J. G. Thomison. The company has had some good orders and look for a fair year on the whole. They had a good exhibit of farm and dump wagons at the local industrial exhibition.

ELECTRICS IN INTERURBAN TRIPS**Review of Interesting Series of Runs Emanating from Detroit**

By A. Jackson Marshall*

A new and interesting experiment which has just been completed by the Anderson Electric Car Co. has attracted an unusual amount of attention among the society people of Detroit and the manufacturers of electric passenger vehicles in general. On June 1, 1,500 invitations were issued to selected prospects of Detroit, specially inviting them to be guests of the company on one or more of 20 interurban runs. The Detroit Athletic Club was the starting point for this series of delightful suburban trips, leaving at 9 a. m. and visiting such places as Grosse Ile, Mt. Clemons, Ann Arbor, Lake Orion and other spots around Detroit. Each day luncheon was served at the destination and the party of guests would return during the afternoon.

These runs were usually made on one charge of the batteries, as much as 112 miles being made on a single charge. Although there were some unpleasant days when the cars had to plow through deep mud, and in spite of several detours over pretty rough road the electric maintained a general average speed of 20 miles an hour and in many cases took hills that have been the ban of Detroit motorists without any apparent difficulty.

The object of these runs was to more thoroughly establish the fact that the electric is capable of any mileage radius that the average family is likely to require; that it is a practical, powerful, family car of all around capability. It is a known fact that the general average of any motor car falls within the radius of 35 miles per day and the electric has the requirements necessary for 98 per cent. of all trips that a family ordinarily undertakes.

This series of runs of the Detroit Electric has demonstrated in a convincing fashion the wide range of service of the modern electric and has opened up new points of interest that had heretofore been thought beyond the range of an electric.

Mr. T. C. Reid, city sales manager of the Anderson Electric Car Co., enthusiastically declared that one of the important results of these runs was the upsetting of the old superstition that electric passenger cars are restricted in their field of operation.

"Although the advantages of the electric car in operation are generally understood," said Mr. Reid, "some people who are not fully informed feel that the electric is pretty much a vehicle for city boulevards only. Without exception men and women who have accepted invitations to take runs have been surprised to note the mileage capacity possible on a single charge. They have had feats of hill climbing also which they thought possible only by a gasoline car, demonstrated to them wherever the occasion demanded. They have found, too, that the electric pleasure car levels the rough roads in a surprising fashion, and can travel along it at a consistent pace of 20 miles an hour with absolutely no vibration. This series of runs has aroused a good deal of comment among dealers in other towns and I would not be surprised to see a similar series held in all the large cities of the country. The runs have proved that the electric car of today is a modern powerful automobile in every sense of the word."

The suburbanite should be especially interested in this recent demonstration of the practicability of the electric. For the short run from suburb to city no other car could better suit his purpose, and its simplicity and safety should especially appeal to the women of the family. Although some may hesitate at the initial cost of an electric, this should not necessarily be the determining factor, as the operation cost of the storage battery car is so comparatively low.

The life of the average gasoline passenger car is from one-half to one-third as long as that of an electric. Today there are many electrics in operation that were built 12 and 15 years

ago and, barring some unusual accident, they are good for many years to come. The Aerial Age Weekly, of June 28, in reviewing motors to be employed on model aeroplanes, states in referring to a simple light-weight motor designed by Mr. J. F. McMahon, that the friction in stationary engines is caused by the pistons continually jumping up and down like so many pile drivers.

"If you should take an engine in your hand and spin the crank shaft between the fingers, this jumping will be noticed. But take the crank shaft, hold it steady, then spin the cylinders, and you will find the reason why the rotary motion is the only one for use in model aeroplane work, and the answer is plain because all parts, pistons and valves are simply sliding around an axis, and not hammering."

This statement on the part of the Aerial Age Weekly is particularly significant, as the type of engine unfavorably reviewed is the reciprocating type as employed in the gasoline car, whereas the revolving type is the kind used in the electric car. Furthermore, the electric having but one major revolving part, friction, vibration and the resulting strain are reduced to a minimum. Mechanical simplicity is one of the prime assets of the electric vehicle and one which should be emphasized when considering the general cost of upkeep and operation.

REORGANIZATION OF COLUMBUS BOLT WORKS

The business of the Columbus Bolt Works, Columbus, O., has recently been taken over by a new corporation known as The Columbus Bolt Works Co., with an authorized capital of \$360,000, which was organized for the purpose. As a result of the reorganization the control of the company passes into the hands of J. R. Poste, who has been with the Columbus Bolt



J. R. POSTE
President and General Manager
Columbus Bolt Works Co.

Works for many years, recently as secretary and general manager.

The new concern has announced that it will follow a live, progressive policy. The three large plants now operated by the company and employing hundreds of men, were not shut down at any time during the recent depression, which fact is an evidence of the standard and staple lines of material manufactured, as well as its methods of marketing the products.

*Secretary Electric Vehicle Association of America, 29 West 39th street, New York.

The bolt department is located in a large five-story, concrete, fireproof construction building in West Chestnut street; the forging department, where steel drop forgings of every description are now being supplied to practically all the leading automobile and carriage manufacturers, occupies a building of tremendous floor space at Randolph and Gorman streets, to the west of the main office building, and the hot pressed nut department, catering largely to the railroad companies, is housed in a mammoth steel and concrete building in Dennison avenue.

The incorporators of the new company are: J. R. Poste, J. H. Poste, W. F. Burdell, Beale E. Poste and S. H. Barrett. The officers are: J. R. Poste, president, treasurer and general manager; J. H. Poste, vice-president; C. A. Fleming, assistant treasurer; H. A. Mason, secretary.

AVERY INCREASES SALES

During the first half of the current year the sales of the Avery Company, of Peoria, Ill., showed an increase of more than a quarter of a million dollars as compared with the sales for the corresponding period of 1914. During the same period the value of shipments increased to the extent of \$338,000. These facts were disclosed in an interview with President J. B. Bartholomew printed in the Peoria Journal. The full significance of these increases is not realized until one recalls that the company's foreign trade has been greatly diminished on account of the war in Europe and that the gain in trade is therefore confined to the domestic field. This showing is better than the figures indicate.

Mr. Bartholomew also stated that the company is about to place on the market two new small tractors, one that will be sold at \$550 and the other probably at less than \$200. These tractors will be produced on a large scale, as the company is assured of an enormous demand for them.

The Avery Company is now employing nearly 1,000 men and the force is working more hours per day than it did at any time last year. Mr. Bartholomew is optimistic concerning the trade outlook.

\$22,000,000 IN AUTO TRUCKS EXPORTED

More than 10,000 automobile trucks of all descriptions have been shipped to England and France since the outbreak of the war. These have a value of \$22,000,000, and consisted largely of three and five-ton trucks. These figures will be greatly increased, as orders have been placed for additional trucks, to be delivered as quickly as possible. While the utmost secrecy has been maintained in the placing of auto truck orders, the needs of some of the countries were so great at the beginning of the war that the officers entered the field and openly bid for them. The following detailed list shows some of the more important orders which have been placed with American concerns by the allies since the outbreak of the war with Germany: Automobiles, including wagons—Kelly-Springfield, 700; Pierce-Arrow, 1,150; White Company, 3,000; Packard, 1,250; Jeffrey Trucks, 490; Garford, 300; Overland, 700; Kissel, 110; Federal, 310; Autocar 425; Standard, 225; Sauer International, 140; Knox Tractors, 30; Wagons—Seele Bros., Akron, O. 1,500. The largest purchaser of auto trucks has been the French government, where the average life of an auto truck is said to be but seven days. Others who have bought of American manufacturers are the English, Russian, Greek and Belgian governments.

TWO-SPEED REAR AXLE SUIT

Claiming damages in the sum of \$100,000 Dempster M. Smith has filed suit in the District supreme court at Washington, D. C., against the Cadillac Motor Car Co., Detroit, Mich., and the Cook & Stoddard Co., their Washington agents. Smith claims that he is the inventor of certain improvements for a motor car to change the speed gearing; that letters patent were issued to him by the patent office on February 7, 1911, and

January 27, 1914, for these inventions. He further alleges that the Cadillac Company and the Cook & Stoddard Company have sold cars equipped with double direct-drive transmission gearing, which, he claims, is an infringement on his invention and that said gearing is in all respects similar to the gearing covered by the letters patent which he holds. He alleges that these cars have been exposed for sale since the issuance of the patents to him. Smith is a patent attorney and is associated with a patent law firm in Washington.

FOUR WHEEL DRIVE CO. BUILDS ADDITION

The Four Wheel Drive Co., of Clintonville, Wis., recently broke ground for a large addition to the present factory. The new building will be built adjoining the present factory and will cover an area 100 x 185 feet. It will be brick and steel, absolutely fireproof, and will be used for assembly purposes.

At the same time additional machine shop facilities will be added covering a like space.

This substantial addition to the present factory is the fourth building erected in the last three years by the company. The company is at the same time adding materially to its equipment.

At the present time the company is turning out approximately 75 three and five-ton chassis a month. The enlarged factory and improved facilities will permit an output of 100 to 125 trucks a month.

WILL DISCUSS ROAD OILING

A discussion of the value and correct methods of application of road oil as a dust preventive will form part of the program of the Pan-American Road Congress to be held at Oakland, Cal., September 13 to 17. The Congress will be held under the auspices of the American Road Builders' Association and the American Highway Association. The Pacific Coast Good Roads Congress is to be held in conjunction with the Pan-American Congress. All states in this country, provinces in Canada and South American countries have been invited to send delegates.

\$100,000 ADDITION FOR FEDDERS

The Fedders Mfg. Co., Buffalo, N. Y., will spend \$100,000 on a new four-story addition to its plant. When the new place is finished the floor space of the plant will be doubled. The offices, which are now in one of the old buildings, will be moved there and the space that they occupy at the present time will be added to the factory. Besides housing the offices it will include the service department. The new building is one story higher than the other buildings which comprise the plant. Brick and steel are the principal materials in its construction.

SALE OF MICHIGAN BUGGY CO. PLANT

Part of the plant of the old Michigan Buggy Co., Kalamazoo, Mich., has been purchased by representatives of the States Motor Car Co., of Toledo, O. The consideration is stated to be \$60,000. The States company will manufacture a four-cylinder roadster and touring car, to be known as the Greyhound, and which is to be listed, it is stated, at \$600. Those interested in the Toledo concern are W. D. Smith, Toledo, O.; Dr. F. C. Bonine, Niles, O.; James H. Johnson, South Haven, Mich.

THE N. I. V. A. CONVENTION

Preliminary announcement has been issued from the office of Secretary McCullough, of the National Implement and Vehicle Association, relative to the twenty-second annual convention of that organization. This will be held at Indianapolis, Ind., Wednesday, Thursday and Friday, October 20, 21 and 22. The convention headquarters will be at the Claypool Hotel, where the sessions of the convention also will be held.

STANDARD POLICY AIM OF SERVICE MANAGERS

Detroit Convention Votes to Draft Standard Service Policy System for Trucks and Passenger Cars

The movement for a standard service policy received a decided impetus from the Service Managers in convention at Detroit on June 29-30. Officials and service men from all parts of the country were at this convention. Much good in the way of results was predicted by Alfred Reeves, general manager of the National Automobile Chamber of Commerce, who occupied the chair.

A committee was voted to formulate into a standard policy the ideas of the convention as to what should constitute the service the dealer should render the purchaser of a car. It was also voted to recommend to the N. A. C. C. that it start an advertising campaign to aid in telling the owner what he should expect in the way of free service, and also to get to the various local trade organizations along this line.

It was the majority attitude that general repair shops should not be given discounts on parts, this being against the ethics for dealer protection.

Different service policies for passenger cars and trucks were deemed necessary due to the diverging conditions entering into the work of the two classes of vehicles. The need for censoring dealers' parts orders was brought out, this applying especially to the small dealer, whose experience would not make him so good a judge of what parts he should carry as the manufacturer is.

Much discussion of the C. O. D. method of payment for parts ordered was discussed, and most agreed that though it has its drawbacks, it is the best policy to pursue, taken from all angles.

Standard Policy

That there is need for some form of standard policy on the matter of service which the car owner gets free from the dealer, there was little doubt. As Mr. Reeves put it, a standard policy would be a printed backbone in the hands of the dealer. It would cut out the cut-throat competition on service which is now doing much to ruin dealers' business. In fact, the matter of a service policy was the real cause of the convention, for it was desired to get some expression on the subject from the service men.

Alvan Macauley, vice-president and general manager of the Packard company, thinks that service and a standard policy are the vital things of the business now. Whether or not the manufacturers get this service matter down to a reasonable basis and hold it there, will largely govern their staying in the business, he said. Dealers have to contend with all sorts of customers, such as women, men trading on their name, etc., and most of these are good bargainers who will get all they can for nothing. As this gratis treatment often eats up the dealer's profit, all must get together and have an understanding of what constitutes the service to which the customer is entitled.

A. B. Cumner, service manager Autocar company, believes the time is ripe for such educational campaigns as will acquaint the public as to what service should and would consist of. Mr. Reeves explained that the prime reason for a standard policy is that nearly every dealer handles several makes of cars, and if there is not some standardization in the service he is to render all buyers, he is apt to hold the manufacturer with the best policy up as an example to the others.

E. W. Cotton, secretary McFarlin company, used the words "coerced service" to describe the kind of service which the dealer often is obliged to give under the present conditions. The hint of buying a new car often is the bait which makes a dealer do more than he should for a car owner.

Four Essentials

In establishing what he thinks constitutes service to the owner, Charles Gould, manager of service for the Maxwell

company, laid down four main points to which the dealer should pay special attention:

1. Parts; 2. Repairs; 3. Supervised instruction regarding the car; 4. Co-operation with the owner.

In connection with the first of these, a sufficient supply of parts located so as to get them to the customer quickly is very important. Accidents, the lack of oil and grease in the machine, driving and temperamental differences between owner and dealer are not points which should come under the definition of free service. The owner ought to know exactly what gratis service he will get, and before any repairing is done, he ought to be told how much it will cost, if it is possible to tell him. The manufacturer should really be the umpire between the dealer and the owner in the matter of disputes, Mr. Gould believes.

J. B. Coy, technical and service department, Peerless company, said that there should be little variation in the opinions of the delegates on this service matter. Installing a vehicle properly after sale was emphasized by him as a part of service, and further than that the manufacturer should stand on whatever he feels morally obligated to deliver.

The Spoiled Customer

W. H. Doddridge, service manager, the Winton company, pointed out that the customer had been spoiled in most cases until he expects everything he can get now. Any standardization will have to be flexible, he thinks, so long as owners have different ideas. Much of the imposing on dealers is due to the overworking of such words as booster and big man. These are used by persons trying to get something for nothing from the dealer. Salesmen are also responsible for a lot of service evil, for when selling cars, they imply a great many things that the dealer is unable to do free. They use another overworked phrase, "Leave it to me."

E. T. Klee, service manager, Stutz company, is against the practice of having road repair men, as they disrupt organizations, cost money and make it too easy for the customer to get a lot of service free which he is not entitled to. The dealer should not have a territory so large that he cannot send a repair man at small expense from his own shop.

Sales Department at Fault

Much of the service trouble begins in the sales department in the opinion of A. J. Banta, Chicago branch, Locomobile company, who says that more is given away by the service department in making good the extravagant promises of the sales department than in any other way. Service means everything for nothing with the salesmen.

That the salesmen should keep service as far in the background as possible is the view of G. E. Drawe, assistant secretary and treasurer, Pathfinder company, who emphasized the fact that the car buyer is usually a better salesman than the car salesman, else he would not have the money to buy a car. Thus, he sells the car salesman for whatever he wants in the way of free service.

A. B. Hanson, Chalmers service manager, quoted the printed text of his company's idea of service. It is that service does not mean giving something for nothing. It means giving prompt attention at the least possible cost.

Mr. Cumner offered two good definitions. Service, he said, is the providing of all necessary means of keeping a car running, while free service is the taking care of mistakes and conducting an educational campaign.

Educational Service

H. W. Drew, service department Marmon company, pointed out that service is doing as much as possible for the owner at the least possible expense. He thinks a lesson might be drawn from the service rendered by certain of the parts makers, such as storage battery people, electrical equipment makers, etc. Service should be more educational and less individual, Mr. Drew aptly put it. If better information were put into instruction books, and if letters were sent to owners from time to time on the care of various parts of the car, much could be accomplished.

Dealers' Service

The question of whether or not the dealer's service policy should go farther than the manufacturer's warranty, was generally answered in the affirmative, it being considered that this warranty refers specially to defective material and workmanship. Then, the dealer's policy refers to a special field and it varies.

It is a ticklish question and one that is hard for the manufacturer to dictate, Mr. Drew said. The successful dealer has devised special methods which apply to his community, and he is naturally more familiar with his clientele than is the manufacturer, and he naturally should radiate on the manufacturer's guarantee. The small and weak dealers are the ones who need an education campaign the most.

H. H. Carpenter, service manager, Saxon company, thinks the service given by dealers is a cut-throat proposition which is done to sell cars, promising anything to make the deal. He agrees with an educational campaign to make a common ground for all to work upon.

On the other hand, Percy Owen, Chalmers general sales manager, believes in definitely stating what the dealer should do in the way of service. He outlined the policy which his concern is operating upon, explaining the distinction which is made between what is termed technical service and shop service or full repair work. The technical service, which takes in thorough inspection and adjustment of the car, is what the dealer is instructed to render free for a stated period. The dealer also absorbs the labor cost on replacement parts which the manufacturer sends free, this within reasonable limits, of course.

Truck salesmen are superior to passenger car salesmen in the opinion of L. L. Virgil, service manager, the Jeffery company, who says that he has no special trouble through salesmen promising more than the factory can do. Before anything can be done on the matter of starting an educational campaign on service, the committee will have to decide on what policy is to be followed, and this will have to be approved by the head officials of the various companies through the N. A. C. C., Mr. Reeves explained.

Trucks and Cars

Up to a certain point, service policies for passenger cars and trucks can be the same, but the work they have to do and the attitude of the owners are so different that it seems advisable to lay down separate policies for the service treatment of the two classes of cars. This was the gist of the paper which Mr. Macauley read on the subject.

For either class the warranty work is the same. This means the repair work which the manufacturer does gratis for moral reasons. Good will advertising, conditions of service and requirements dictate separate policies beyond this point. Truck drivers do not have time during business hours to stop and make repairs, while passenger car drivers and chauffeurs have time. Trucks are relatively slow-moving vehicles, and it therefore takes a comparatively longer time to bring them to a service station than it would a passenger car. Further, they are less under the owner's supervision than a passenger car, and they also operate on solid tires. All of these things make the service problem different. The particular policy for service which is laid down is not important. It is the placing of something definite in the salesman's hands that is important, Mr. Macauley said. Let the owner know exactly what to expect.

Representatives of White, Reo, and others who make both cars and trucks said that their policies for the two classes of vehicles differ, generally more leniency being exercised with the trucks.

Censoring Parts Orders

The problems of how the manufacturers can assist in preventing dealers from overstocking and being obliged to return obsolete parts was well handled by C. W. Matheson, director of service for Dodge Brothers, who said that parts orders should be carefully looked into to prevent unnecessary investment and loss to manufacturers through having to redeem obso-

lete parts later. When a maker contemplates a change, dealers should be advised so as not to put in orders for parts soon to be superseded. He advocates a card ledger system, crediting and debiting it as parts are added or taken out. This is for the dealer. By taking into account the average selling rate of cars in any territory, it is easy to arrive at the average consumption rate of parts, and this procedure should be carried out in connection with orders. Mr. Matheson believes in giving a dealer a time limit of one year, after which it becomes optional with the manufacturer to redeem obsolete parts.

R. E. Winans, service manager, Paige company, suggested taking the experience of other dealers in suggesting to new dealers how many parts to carry in proportion to the number of cars.

Summing up the discussion on this topic, it was agreed that the main object is to supply the customer, so that nothing should be done that would curtail the quick service on repair parts. There was some sentiment for penalizing the dealer for the lateness of return of superseded parts. That is, discounting them after a certain time. It was also recognized that geographical conditions might make one part more important in one locality than other. It was considered a good thing to use a maximum and minimum scheme, whereby the dealer is required to order more of each part when the number on hand falls to a set minimum. In this case, he requisitions for sufficient to bring the stock of that part up to the pre-determined maximum. He has no choice in the matter. It did not seem necessary for a dealer to carry parts for cars older than two years, such parts coming from the stock at the factory.

Standardized Account

It was brought out by A. H. Ransen, manager parts order department, Studebaker, that inasmuch as the parts order department is a business within itself, there should be a standardized plan for handling the parts accounts with dealers. Among the features should be a deposit to guarantee parts accounts, and a cash discount for prompt settlement. It is primarily a matter of dealer education, also.

Mr. Owen is strongly in favor of a deposit per car order on parts, and believes that a standard form of accounting would assist dealers. He thinks the C. O. D. system a fixture. The keynote was struck by W. D. Smith, Cole service manager, who said that it is particularly essential, since dealers handle different lines of cars.

General Repair Shops

J. A. Harris, Jr., advertising manager, the White company, took the stand in dealing with the subject, "Should Manufacturers Encourage General Repair Shops By Selling Them Parts," that the matter of repairing and overhauling will soon become so great in certain localities that the dealer will not be able to handle it all, and therefore outside shops will have to be established. Then care should be taken in shop selection to make sure that they can do the work properly and as quickly as the parent shop.

C. J. Boilon, service manager, Kelly-Springfield truck company, thinks it inadvisable to have repair shops where there is a dealer, as this creates friction. J. F. Plummer, Locomobile company, also believes that dealers should be protected, and therefore is not in favor of discounts to local repair shops in territories covered by dealers. Where there are no dealers then establishments on a parts selling basis are advisable for the convenience of owners. Several others were practically of this same opinion.

There was little discussion of the paper, "How Can the Manufacturer Satisfy Himself That the Dealer Who Receives a Credit Installs the Part in the Customer's Car Without Charge," which was read by Mr. Klee. He outlined a method of having the owner sign a tag which is attached to the part sent back to the factory for replacement. On credit being issued to the dealer, the owner who signed the tag is notified. Several modifications of this method were explained, but they were all along the same line of advising the car owner.

The matter of issuing service coupon books to customers was

brought up, and there was some discussion. Several individual dealers' schemes independent of factories were explained in addition to a description of the Federal, Chalmers and other factory coupon book plans. It is evident that the scheme admits of many ramifications.

DIDN'T KNOW MR. FORD

There are any number of stories told concerning Henry Ford, of Detroit, and the well known product turned out in his shops, but a Wall Street man who recently returned from Detroit vouches for the truth of this one, which he says Ford told on himself.

It seems that Ford, who believed in using his own cars, was out in the suburbs of Detroit one day and stopped when he saw a driver of a Ford car trying to start his machine which had failed from some cause. The driver did not appear able to locate the trouble, so Ford got out from his car and tendered his services.

In a few minutes the stalled car was ready to run again and the owner, after thanking his unknown benefactor, pulled a half dollar from his pocket and tendered it saying: "Stop at the first place and get yourself some cigars."

The money was declined with the statement, "I have more money now than I can find any use for, and I was only too glad to help you get your car started again."

The owner of the rejuvenated car looked at the Good Samaritan and then at Ford's car and said with emphasis, "You're a liar. If you had more money than you knew what to do with, you wouldn't be running a Ford."—Wall Street Journal.

STUDEBBAKERS INSURE 6,500 MEN

Through a contract, effective July 2, with the Equitable Life Assurance Society, the Studebaker Corporation has provided for the insuring of every workman in its several plants with life insurance without expense to them. Approximately 6,500 are affected at present and when the system is extended throughout the corporation 12,000 will be receiving protection free.

The life of each employe is protected by the plan, regardless of how long a time he has been connected with the corporation. No medical examination is required by the insurance company, it accepting the one which all applicants for employment undergo before entering the factory. The policy involves several millions of insurance, providing fixed amounts for each individual.

\$40,000 ADDITION TO HUDSON PLANT

A permit has been issued for the erection of two factory additions to the plant of the Hudson Motor Car Co., at Jefferson avenue east and Conners creek, Detroit. The cost of the work is estimated at \$40,000. The additions, which are to be of reinforced concrete, are two and three stories high, respectively. The two-story addition will be 60 feet wide by 180 feet deep, and the three-story addition 60 feet wide by 100 feet deep.

OVERLAND TO BUILD WAREHOUSE IN ST. PAUL

A contract for several acres of land has been closed in St. Paul, Minn., for the erection of a \$250,000 warehouse by the Willys-Overland Co. The plant will combine the facilities of a warehouse and an assembling station, according to present indications. St. Paul is considered as an excellent distributing point for the northwestern territory as the shipping facilities by rail and water are unsurpassed.

"Motors on hire" are advertised by the Municipal Electricity Department of Shanghai, China.

PERSONAL

Charles M. Peters, of the Peters & Heron Dash Co., has returned from a six months' trip to Cuba, Panama, South American points, Hawaii and the Pacific Coast.

E. L. Roninger has resigned his position with the Banner Buggy Co., effective July 1.

FORD CO. WILL MAKE ITS OWN TIRES

The Ford Motor Co., according to an announcement by Henry Ford, will begin manufacturing its own tires, which should be ready for the 1917 cars. The new tire plant will be a part of the new manufacturing center to be built for the Ford tractor. The output of tires is placed at 2,000,000 for the first year, and the \$5 per day schedule will apply to all workers at the new plant, it being estimated that by 1917, 50,000 to 60,000 men will be employed by the Ford company.

PACKARD GETS PRIZE AT FRISCO FAIR

The Grand Prize of the Panama-Pacific Exposition for excellence in the field of automobile manufacture has been awarded the Packard Motor Car Co., of Detroit. Fifteen gold medals were distributed in the transportation division and among those who received prizes were Pierce, Cadillac, Ford and Rolls-Royce.

SALE OF LAUTH-JUERGENS CO.

The business and plant of the Lauth-Juergens Motor Car Co., at Sandusky, O., has been purchased by a new company incorporated under Ohio laws with \$250,000 capital stock. The new company will be called the H. G. Hurford Company, with present headquarters at Fremont, O.

CANADIAN IMPORTS—CARRIAGES, ETC.

During the twelve months ending September, 1914, Canada imported from the United States carriages, carts, wagons, cars, etc., to the value of \$11,859,197.

TO MANUFACTURE TRAILERS

The Erie Trailer Mfg. Co., Erie, Pa., has established a plant at Twelfth and Liberty streets for the manufacture of trailers to be attached to automobiles. These will be made in different capacities for various hauling purposes. In addition a line will be made for attachment to jitney busses for carrying passengers.

TO MAKE AUTO WHEEL BUILDER

The Hinkle Mfg. Co. has been formed in Xenia, O., to manufacture automobile wheel builders. C. R. Hinkle is president. Stock is now being sold and within a short time the company will take up the active manufacture of the new machine.

DEATH OF GLASGOW CARRIAGE BUILDER

The death occurred recently of Mr. Alexander Henderson, the well known carriage builder of Glasgow, Scotland. He was a member of the Council of the Institute of British Carriage Manufacturers, and was president of that body in 1897.

ELECTED PRESIDENT OF KELLY E. A. M. A.

G. H. Kelly, secretary of the Baker R. & L. Co. was elected president of the Electric Automobile Manufacturers' Association at the annual meeting held recently in Cleveland, to succeed L. E. Burr, of the Wood company.

Trade News From Near and Far

BUSINESS CHANGES

J. F. Simpson & Bro. have succeeded to the Mooney Wagon Co. business at Knoxville, Tenn.

E. A. Mann has bought the implement, hardware and buggy business of E. B. Place, Grenola, Kas.

Smith & Werts, of Wabash, Ind., have sold their vehicle and implement business to Geo. E. Heister.

Geo. E. Heister, of Wabash, Ind., has purchased the implement and vehicle business of Smith & Werts.

Wright & Son have succeeded to the implement, hardware and vehicle business of Covington & Wright, at Chilhowee, Mo.

Rush Cumberland, in the implement and vehicle business at Urbana, Ia., has taken in a partner and the firm name now is Cumberland & Kramer.

Perry Pearson has sold his interest in the implement and vehicle business of Weesner & Pearson, Wabash, Ind., to Owen Harvey. New firm name is Weesner & Harvey.

M. E. Kenneally will continue the carriage business of W. P. Kenneally at the old stand, 86 Center street, Middletown, Conn. Painting and repairing of carriage and automobiles is a special feature of the business.

Francis E. Garn, postmaster at Plymouth, Ind., has purchased the implement and vehicle business of I. N. Good, at Rochester, Ind. Mr. Garn will finish his term as postmaster next August and in the meantime will conduct the business.

NEW FIRMS AND INCORPORATIONS

A. T. Anderson has started a vehicle and implement business at Adams, Minn.

Leon Howard is opening a vehicle and implement business at Neillsville, Wis.

Smith & Tronlove, Donnoha, N. C., will establish a buggy factory at King, N. C.

J. C. Schlotfeldt has opened a vehicle and implement business at South Haven, Minn.

MacIntosh Bros. have engaged in the vehicle and implement business at Louisville, O.

F. J. McCauley has engaged in the implement and vehicle business at Murdock, Minn.

E. G. Smith has engaged in the vehicle and implement business at Round Lake, Minn.

The Alma (Ga.) Hardware Co. has engaged in the vehicle, hardware and implement business.

Motley & Husted have engaged in the vehicle, hardware and implement business at Osceola, Mo.

Bauercamper & Turner have engaged in the implement, hardware and vehicle business at Chestertown, Md.

The Farmers' Union has been organized with a \$15,000 capital stock at Murdock, Neb., to deal in vehicles and implements.

John Hasz and Jacob P. Neubarth have formed a partnership and will engage in the implement and vehicle business at Menno, S. D.

The Montgomery County Implement Co., Red Oak, Ia., has been incorporated with a capital stock of \$20,000, to deal in vehicles and implements.

The Kerr Hardware Co., of Athens, O., has been incorporated with a capital of \$10,000, to deal in hardware, implements and vehicles, by Merril Kerr and others.

The Spartan Buggy & Wagon Co. has been organized at Spartansburg, S. C., with a capital of \$3,000. A. L. Johnson is president; B. T. Legg, secretary-treasurer.

The Burlington (Ia.) Buggy Co. has been incorporated with a capital of \$25,000 to manufacture vehicles. The company will occupy the plant of the old company bearing the same name. The officers of the company are: President, F. H. Keys; vice-president, T. F. Bishop; secretary and treasurer, N. A. Keys.

The capital stock of the reorganized Schmidt & Stork Wagon Co., at West Bend, Wis., is \$55,000. The following officers have been selected: President, Fred Schmidt; vice-president, Emil Backhaus; treasurer, Fred Stork; secretary, A. C. Fuge.

The American Hame and Singletree Co. is a new concern at 618 Sidney St., Chattanooga, Tenn., to make these lines of ash and hickory. They have been very busy, selling in the south only. A. T. Holzbog, president of the concern, was formerly manager of the American Hame Mfg. Co., New Albany, Ind.

NEWS OF THE TRADE

The Mogul Motor Truck Co., 6100 Maple avenue, St. Louis, Mo., will equip a plant to cost about \$50,000.

It is reported from Grand Rapids, Mich., that the Austin Automobile Co. of that city will erect a new plant.

The Federal Motor Truck Co., Detroit, has begun the erection of a one-story brick and steel addition to its plant.

The Bower Roller Bearing Co., Detroit, manufacturer of roller bearings, etc., has increased its capital stock from \$225,000 to \$300,000.

The Hinkle Mfg. Co., Xenia, O., has been incorporated by D. G. Powers, and others, to manufacture a patented machine for making automobile wheels.

The Empire Automobile Co., Connersville, Ind., has leased the factory buildings at Indianapolis formerly occupied by the Federal Motors Co. and will move its plant to Indianapolis.

The Chalmers Motor Co., Detroit, has had plans drawn for a four-story addition to its No. 5 building. Several manufacturing departments will be enlarged upon the completion of the new addition.

The Studebaker Corporation, according to statement of R. E. Benson, vice-president, Detroit, Mich., plans the construction of a distributing plant in Portland, Ore., this summer, to cost about \$90,000.

The Nineveh Coach & Car Co., Nineveh, N. Y., has increased its capital stock from \$15,000 to \$150,000, to provide for the construction and equipment of buildings to be devoted to the manufacture of automobile bodies.

The Briggs-Detroit Co., Detroit, automobile manufacturer, has been adjudicated a bankrupt and the Detroit Trust Co. has been appointed receiver. Assets are estimated at about \$170,000 and known liabilities are listed at \$350,000.

The Hudson Motor Car Co., Detroit, will erect two additions to its factory at Jefferson avenue, East and Conners streets, of reinforced concrete, two stories, 60 x 180 feet, three stories, 60 x 100 feet, at a total estimated cost of \$40,000.

The Mercer Automobile Co., Trenton, N. J., has awarded a contract to Burton & Burton, American Mechanics Building, Trenton, for the construction of a one-story addition to its factory, 60 x 400 feet, of brick and steel, to cost about \$20,000.

The Cleveland Welding & Mfg. Co., Cleveland, O., maker of automobile wheel rims, has awarded a contract for the erection

of a new plant extension that will provide 27,000 square feet of additional floor space. The company has placed orders for much additional special machinery.

The Pierce-Arrow Motor Car Co., Buffalo, N. Y., has let a general contract to the Aberthaw Construction Co., Boston, Mass., for the erection of an extensive addition to its plant at Elmwood avenue and New York Central Railroad Belt Line, 60 x 400 feet, four stories, of steel and concrete, to cost approximately \$200,000.

The Haynes Automobile Co., Kokomo, Ind., is building a four-story factory building, including a power plant. It is to be equipped with the latest type of machine tools. The company has also purchased a site for a paint shop, 100 x 132 feet, and it will shortly build an office building. Since January 1 it has purchased about \$75,000 worth of machinery.

The Winona Wagon Co., of Winona, Minn., has discontinued the jobbing arrangement under which its line has been sold in Minneapolis territory during the past year and hereafter will sell direct to dealers as it did for many years. A stock of wagons will be carried at Minneapolis and the company's travelers in Minneapolis territory will make headquarters in that city.

The Fisher Body Co., Detroit, manufacturer of automobile bodies, has purchased a three-acre site improved with a four-story building, 65 x 250 feet, from the Universal Motor Truck Co. In addition to occupying the present building the company will erect a mill building 80 x 300 feet, and two dry kilns, each 60 x 80 feet. The new plant will be placed in operation as quickly as possible.

The Burns Wagon Rack Co., 390 Hayward avenue, Rochester, N. Y., has been incorporated with a capital stock of \$40,000 by Samuel J. Sayers and others. William H. Burns is president; Orrin Simmons, vice-president, and Mr. Sayers is secretary and treasurer. The company received bids for the construction of their rack July 8, and plan to establish an office near the plant of the successful bidder.

Frederick H. Wadsworth, secretary and treasurer of the Michigan Steel Boat Co., the Detroit Engine Works and the Detroit Motor Car Supply Co., has purchased property in Grand Rapids, Mich., as the site for a new factory. It is understood that the construction of a four-story factory, 240 x 260 feet, will be started at once. The building is to be used by a new company in the manufacture of motor car bodies.

FIRES

O. L. Ramer, in the implement and vehicle business at Walton, Ind., suffered a severe fire loss.

Fire destroyed the warehouse of the Keller Wagon Co., in Minneapolis, Minn., July 1. Loss, \$4,000.

The implement and hardware store of D. C. Middlema, at Clay City, Ind., suffered slight damage due to fire.

For the third time a factory of the Thomas Graham Co., spoke manufacturer at Madison, Ind., burned June 29. The loss is about \$25,000.

The loss inflicted by the recent fire in the plant of the B. C. Bristow Co., carriage manufacturers of Richmond, Va., is stated to reach to between \$35,000 and \$40,000. Insurance was \$9,000. About \$5,000 worth of new stock was destroyed that had been stored on the premises during the week preceding the fire.

MOTORS A BANK CRITERION

Any Kansas town which has 97 motor cars in its neighborhood and enough progressive farmers to fill them is entitled to a bank. So ruled the state charter board recently when it granted a charter to the state bank of Zenith. Zenith is a village of about 150 in Stafford county. It is between Stafford and Sylvia, both good towns. Zenith is not incorporated.

HANDBOOK OF INDIA

An export field that has not in the past been given adequate consideration by American manufacturers—a field moreover of almost limitless potentialities—is that of India. That empire, by reason of its vast population, its splendid (evenly if unequally distributed) resources, and the new wants created by the gradual development of modernity among an ancient people, presents to the American exporter a singularly attractive opportunity for the exercise of his commercial energy and acumen.

Those engaged in the furtherance of American foreign trade have been devoting to it the most thorough and painstaking attention, and to these investigations a special timeliness has been imparted by the European war. India, in 1913-14, imported from Germany and Austria-Hungary, respectively, \$41,092,000 and \$13,920,000 worth of goods.

India has a population of 315,000,000 and an area of 1,802,192 square miles. Its imports in 1913-14 amounted to the enormous total of \$594,517,000, of which the United States furnished only \$15,542,000. The value of American products consumed annually in India is less than \$0.04 per capita.

In an effort to stimulate interest in the Indian market and to emphasize the salient aspects of the trade, the Bureau of Foreign and Domestic Commerce has just issued a handbook of about 640 pages, dealing with the resources, industries, and commerce of India. This book contains many illustrations, a large detailed map, and facts concerning a multitude of Indian activities and conditions. It describes thoroughly the trade in all important imports. Every subject having a bearing on trade and its expansion has been covered. There are interesting accounts of the Native States, and of Ceylon, Afghanistan, and Tibet.

This volume, which is regarded as one of the most valuable publications ever prepared by the Bureau, is entitled "British India" and is No. 72 in the series of Special Consular Reports. It may be obtained for \$1 from the Superintendent of Documents, Washington, D. C.

\$1,180,000,000 SPENT ON AUTOS IN 1915

On June 1, of the present year, the number of automobiles in the United States for the first time reached 2,000,000. Figuring on an average of four persons to each car, which is very conservative, there are 8,000,000 people in this country in daily enjoyment of motoring. What it costs to follow this sport is of interest, because of the stupendous figures involved. To run 2,000,000 cars for one year requires at the very least 1,000,000,000 (one billion) gallons of "gas," worth \$130,000,000; 20,000,000 gallons of lubricating oil, worth \$8,000,000; 12,000,000 tires, worth not less than \$16 a piece, or \$192,000,000; accessories and extra comforts, goggles, gloves and caps, at \$50 per car equals \$100,000,000; garage charges on short tours (exclusive of gas and oil \$100 per car per year, \$200,000,000; repairs made necessary by wear, tear and accident (exclusive of tires), \$50 per car per year equals \$100,000,000. Total running expenses for all cars in use, \$730,000,000. Add thereto the value of the 600,000 new cars purchased during the year, at an average price of \$750 equals \$450,000,000, we get the immense total of \$1,180,000,000 spent in a single year (1915) on the sport of motoring.

AWKWARD

What position should a gentleman assume to lace for a lady a shoe that laces in the back? One who knows answers: The horseshoer's position. The hoof is held firmly between his knees.—Chicago Tribune.

DECLINE IN IMMIGRATION

The immigration into this country during the first nine months of present fiscal year was 272,764. During the fiscal year ending June 30, 1914, the total immigration was 1,218,480.

OBITUARY

Robert J. Flanagan, 62, president of the Lowell Cutter and Buggy Mfg. Co., died unexpectedly at his home in Grand Rapids, Mich., June 23. Death was due to pleuro pneumonia. Mr. Flanagan was born in Ontario, Can. He spent his boyhood days in that province and moved to Michigan while still a young man, settled in Lowell and became prominently identified with the growth of that city. Mr. Flanagan and family moved to Grand Rapids about 12 years ago and had lived there ever since. He is survived by the widow and one daughter.

Robert Henderson, Jr., 77, senior member of the firm of Henderson Bros., carriage manufacturers, Cambridge, Mass., died June 6. Mr. Henderson was a native of Charlestown, Mass. He followed the trade of his father, and, in 1856, with his brother, John J., organized the firm which has successfully carried on the carriage business up to this time. At one period of its existence it was the largest plant of its kind in New England. A few years ago the firm began the manufacture of automobile truck bodies. Mr. Henderson leaves a wife, two sons and one daughter.

G. Heylmann, 81, head of the carriage manufacturing firm of J. G. Heylmann & Sons, Noblesville, Ind., died June 22. He was one of the best known business men in that section of the state. Two sons and one daughter survive him.

James C. Levi, formerly of Louisville and salesman for the Kentucky Wagon Mfg. Co., died at his home in Shores, Va., in June. Mrs. Levi and several children survive. Burial was in Louisville.

Daniel Miller, 82, one of the oldest and most prominent citizens of Alton, Ill., died at his home in that city on June 16. He was born in Seubath, Germany, coming to this country in 1849. In 1868, Mr. Miller went to Alton and engaged in the business of carriage building. He was successful in business, and for many years prosecuted a thriving carriage manufacturing industry. In these days he built up a splendid reputation for the buggies turned out by his factory. The Dan Miller buggies were well known as vehicles of the highest grade. He retired from business a few years ago, turning it over to his son, W. D. Miller, who conducted it alone until early this year, when it was reorganized and others were taken in the firm. His widow, two daughters and one son survive him. One of his daughters is the wife of Scott Cunningham, of Palmyra, Mo., former well known traveler for the John Deere Plow Co., out of St. Louis.

Charles A. Newman, proprietor of the Newman Carriage and Wagon Works, of Dubuque, Ia., died suddenly at his home in that city on June 16. He had been at his place of business all day and apparently was in the best of health and only complained of feeling ill a short time before his death, which was due to heart disease. His widow and two children survive him.

George Schuele, Sr., 68, a retired carriage manufacturer of Louisville, Ky., died at his home in that city on June 19 from cerebral hemorrhage. He was one of the pioneer carriage builders of Louisville and retired from business about 30 years ago. Mr. Schuele was a native of Wurtemberg, Germany. He came to the United States in 1871 and settled in Louisville, engaging in the manufacture of vehicles. He leaves a widow, one son and one daughter.

Edward C. Smith, 69, recently owner and manager of the Fort Wayne Auto Top Co., is dead after an illness of nine months due to a complication of diseases. Mr. Smith was born in Pontiac, Mich., and went to Fort Wayne when 25 years of age. For a number of years he was connected with the Stevens Carriage Works and has been a prominent business man for many years. His widow and three children survive him.

WANTS

Help and situation wanted advertisements, 1 cent a word; all other advertisements in this department, 5 cents a word; initials and figures count as words. Minimum price, 30 cents for each advertisement.

PATENTS

Patents—H. W. T. Jenner, patent attorney and mechanical expert, 606 F St., Washington, D. C. Established 1883. I make a free examination and report if a patent can be had and exactly what it will cost. Send for circular.

SALES MANAGER WANTED

A successful carriage factory is going into the automobile business and wants strictly high-class man for an executive position, Secretary or Sales Manager. Will sell an interest to the right man. None but the highest class men with big capacity need apply. Address "Automobile," care The Hub.

DEATH OF F. M. EDGAR

Well known among the carriage and saddlery trade from the Atlantic Ocean as far west as the Missouri River, and from the St. Lawrence to the Gulf, Freeman M. Edgar, traveling representative for the Eberhard Mfg. Co., Cleveland, O., passed away on June 6, at his home in Newark, N. J. Mr. Edgar was connected with the Eberhard company for over 26 years and was of a genial disposition and unimpeachable character. He was confined to his home for nearly 12 months with heart trouble, before death took place.

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Cargill Quality is bringing The Best Automobile Catalogues to our plant for Complete production—watch for our imprint in the Season's best books.

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WHAT IT IS

The American Harness and Saddlery Directory

The 1914 Edition

An extra painstaking revision of the names (and other information as below) constituting the Retail Harness Trade, has been completed for this year's issue of the Directory, and we think the work is so important and worthy that the

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and it is very moderate for what is offered in a work that is

Indispensable for Reference

for copying of addresses, and for all purposes usual in a directory.

Just a Sketch of Its Contents

The list of the **WHOLESALE** and **JOBGING TRADE** is so arranged as to make it convenient to separate the association members from those not so recognized.

The **RETAIL HARNESS MAKERS** of the United States and Canada comprise the principal part of the Directory, arranged by State, Town and County, and in the large cities, the street and number is given. Those rating (approximately) over \$1,000 are marked.

A list of **HARNESS DEALERS** as distinguished from retail harness manufacturers, is also given. The value of this list to those who solicit the vehicle, implement, hardware and department stores will be readily appreciated.

A list is also published of Export Commission Merchants, giving the class of merchandise they handle.

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THE TRADE NEWS PUBLISHING COMPANY

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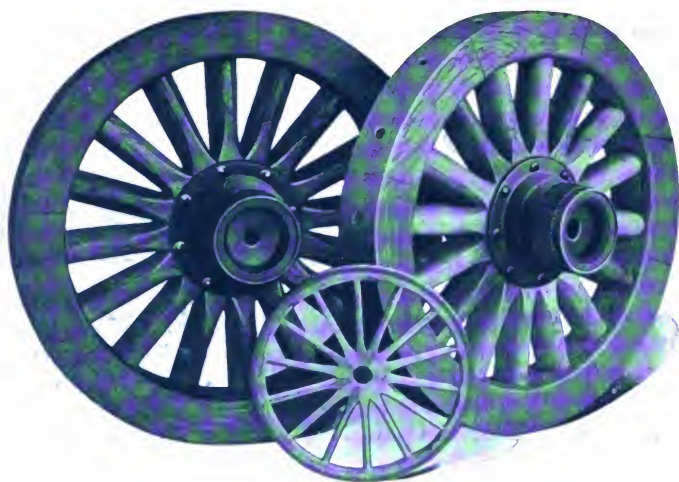
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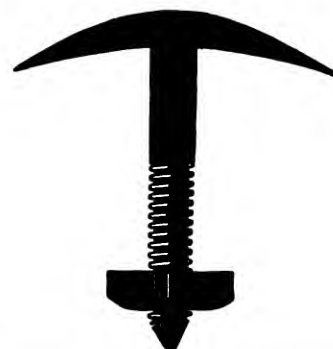
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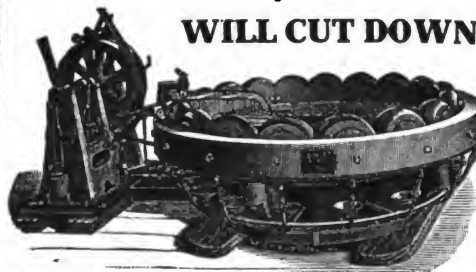
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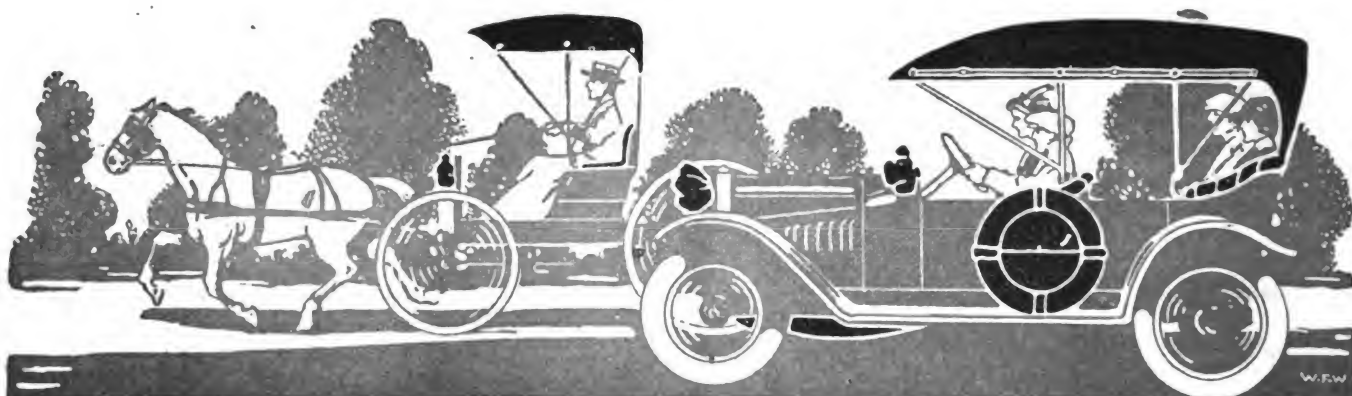
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The Hub

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Vol. LVII

AUGUST, 1915

No. 5

THE TRADE NEWS PUBLISHING CO. OF N. Y. Publishers of THE HUB

J. H. WRIGHT, President

G. A. TANNER, Secretary and Treasurer

EDISON BUILDING, COR. ELM AND DUANE STS., NEW YORK

Other Publications of Trade News Publishing Co.:

HARNESS (monthly).....per year, \$1.00
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THE HUB is published monthly in the interest of employers and workmen connected with the manufacture of Carriages, Wagons, Sleighs, Automobiles and the Accessory trades, and also in the interest of Dealers.

Subscription price for the United States, Mexico, Cuba, Porto Rico, Guam, the Philippines, and the Hawaiian Islands, \$2.00, Canada, \$2.50, payable strictly in advance. Single copies, 25 cents. Remittances at risk of subscriber, unless by registered letter, or by draft, check, express or post-office order, payable to the order of THE TRADE NEWS PUBLISHING CO.

For advertising rates, apply to the Publishers. Advertisements must be acceptable in every respect. Copy for new advertisements must be received by the 25th of the preceding month, and requests to alter or discontinue advertisements must be received before the 12th day of the preceding month to insure attention in the following number. All communications must be accompanied by the full name and address of writer.

FOREIGN REPRESENTATIVES:

FRANCE—L. Dupont, publisher of *Le Guide des Carrossiers*, 78 Rue Boissiere, Paris. Subscription price, 15 francs, postpaid.

GERMANY—Gustave Miesen, Bohn a Rh. Subscription price, 12 marks, postpaid.

ENGLAND—Thomas Mattison, "Floriana," Hillside avenue, Bitterne Park Southampton. Subscription price, 12 shillings, postpaid.

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Building Activity

Contrary to the belief of many, the indications at the present time are that the carriage and buggy building industry is enjoying a season of activity that is far and away above what some pessimistic individuals would have us believe. In the southwest we hear of factories running full time and orders coming in daily for immediate deliveries.

Those who are inclined to think the horse vehicle doomed, or fear that it is fast being crowded out, would do well to ponder the figures of reported sales of horse-drawn vehicles during the past year. Over two million of buggies alone were sold in this country last year and 1915 sales appear to indicate a business for the current year that will compare not unfavorably with that of former years.

Not to overlook the wagon making branch of the vehicle industry, one might call attention to the large orders for trailers that are keeping some of our best known wagon factories running to capacity output, and in some cases even making necessary the building of additions to the existing plants.

No, regardless of the unprecedented activity and production of horseless vehicles, we find the carriage and allied lines holding up to a very satisfactory pitch, and unless some unforeseen and unimaginable cause arises, things will likely remain equally consistent for a long while to come.

Motor Truck Exports

Truck exports for May have again broken previous records. The number of trucks exported during May amounted to 2,426, as against 99 for May, 1914, or a value of \$6,583,912, as compared with a value of \$127,027 for 1914. For eleven months ending in May, exports valued at some \$46,889,835 were divided between 11,006 trucks, valued at \$30,561,880, and 19,462 passenger cars valued at \$16,327,955.

The large sales to the countries now at war in Europe have brought forth the prediction that our manufacturers will experience a big demand for parts from European makers. A representative of one of the belligerents, who has been in this country in connection with truck purchases, is said to have stated that the war will create so large a demand for trucks that foreign makers will have to order large quantities of parts from American manufacturers and assemble them on the other side.

It will be interesting to note the variety and class of material and designs that will take first rank with the foreign makers, particularly as some of our most valuable lessons in constructional design have been received at the hands of European engineers. For we must bear in mind that our immense truck sales to European countries have not been due to the admirable fitness of our product for the work to be done, but rather to the fact that we are the only neutral nation capable of supplying anything like the adequate quantities required, on comparatively short notice.

Good Roads in the South

There are probably few people who are aware of the activity of our southern states in the matter of road building. It is worthy of note, in view of the need and benefits of good roads, to observe the fact that the south has so far expended some seventy millions of dollars in the interest of good roads.

This large sum has also been spent wisely and in a business-like way, rather than by the haphazard means that were in use years ago. It is stated that the Georgia roads now rank second to none, except the state of New

York. Texas has voted over \$25,000,000 in bonds for good roads during the past five years. Bonds aggregating \$7,267,000 were issued during 1913 for this purpose. A single county in Florida has issued a million dollars worth of bonds for road work. And thus we might go on presenting instances of the evident determination of the southern states to attain a place among the possessors of efficient and extensive good roads systems. The Dixie Highway movement is no doubt responsible for the present increased activity along the line of development and it should have the endorsement of all interested, either directly or indirectly, in the advancement of the good roads movement throughout the country.

THE PROTECTION OF BUSINESS

There recently appeared in American Industries an article from the pen of Arthur Wyman, of Chicago, dealing with the origin of business and its relation to civilization, more particularly in reference to the wonderful advancement of our own United States.

Mr. Wyman says, in part, that the relation of business to civilization is almost as old as history itself—for history has clearly shown that business, in its broad sense, is fundamentally essential to civilization.

It has been said of past nations that their rise was due to the development of industrial and commercial supremacy—likewise that their fall was due to the over-development of commercialism to the exclusion and neglect of those duties and ideals of citizenship which are primarily essential to national life.

But in our own country, still in its vigorous youth, and well within the period of development, more immediate questions concern us, not the least of which is that of a proper recognition on the part of our national government and our national legislature of the business man, and the vital importance of his individual and collective welfare—which is logically the welfare of our people as a whole.

Evolving from the status of an agricultural country, the civilization of the United States of today is the direct result of that industrial and commercial development which has made it one of the foremost nations of the world—with its high average of individual prosperity, its lofty ideals and its freedom of individual thought and action which have conduced to the happiness of the happiest people on earth.

Can it not be truly said that it is a sacred duty which we owe to ourselves and to posterity, carefully to study and solve the problems reflected in present day conditions, and to the end that business, the fundamental contributor to our prosperity, our happiness and our higher civilization, may not only be conserved, but that, through the efforts of our ablest business men, laws may be framed on rational, wholesome lines that we may suffer no further impairment of business; but on the other hand, that we may consistently, righteously and with fixedness of purpose, do that which shall maintain and upbuild the structure of business—the very life blood of our national prosperity.

THE CRACK OF A WHIP

In the May issue of *Harness* there appeared Prof. C. V. Boys's idea as to what causes the crack of a whip. The following letter, written to the Editor of *Scientific American*, will be of interest to readers of the article referred to:

I was reading the article in the issue of April 3, "Why a Whip Cracks," giving Prof. C. V. Boys's idea that the speed of the whip is that which produces the sound. I would like to submit the following:

I had spent some little time thinking about this, when quite a while since I was in a half-illuminated harness store where the merchant happened to be trying whips. One particularly loud

snap produced an electric spark at the end of the lash. All of a sudden the idea occurred to me that the snap was not made by the lash at all, but was produced by the action of the lash dividing the air and that it was the instantaneous concussion of the air that produced the snap and the electric spark was the friction caused by the division of the currents of air, the same as in a thunderstorm. Why not?

Canton, Pa.

JESSIE M. JONES.

C. B. N. A. ANNOUNCEMENT

Office of the Secretary and Treasurer,
Mt. Vernon, N. Y.

To the Members of the Carriage Builders' National Assn.:

The forty-third annual convention of the Carriage Builders' National Association will be held in the Central Armory, Hamilton and Lakeside avenues, Cleveland, O., during the week beginning September 19, 1915.

The annual exhibition of parts of carriages, wagons and automobiles, gears, springs, axles and materials used in their construction, will be held in the same place during the convention.

The exhibition from September 20 to 24, and

The convention on the 21st, 22d and 23d.

The official headquarters will be at the Hollenden Hotel, Superior avenue and East Sixth street.

List of Some of the Cleveland Hotels

On the European Plan

The Hollenden Hotel, the headquarters hotel, Superior avenue and East Sixth street. Rates, \$2, \$2.50, \$3, \$3.50, \$4, and \$5 per day, with suites higher. Club meals as well as a la carte service.

Hotel Statler, Euclid avenue and East Twelfth street. Rates, \$2 per day and upward.

Hotel Euclid, Euclid avenue and East 14th street. Rates, \$1 per day and upward.

The Gillis Hotel, East Ninth street between Euclid avenue and Superior street. Rates, \$1 per day and upward.

The New Fuller Hotel, 1601 Euclid avenue. Rates, \$1 per day and upward.

Hotel Huron, 1200 Huron road. Rates, \$1 per day and up.

Kennard House, St. Clair avenue and West Sixth street. Rates, \$1 per day and upward.

Weddell House, 1420 West Sixth street. Rates, \$1 per day and upward.

Forest City House, Public square and Superior street. Rates, \$1 per day and upward.

On both the American and European Plans

Colonial Hotel, head of East Sixth street, entrance through Colonial arcade. Rates, American plan, \$3.50 and upward per day; European plan, \$1.50 per day and upward.

Hotel Tavistock, 1007 Huron road. Rates, American plan, \$1.50 per day and upward; European plan, \$1.50 per day and upward.

American House. Rates, American plan, \$2.50 per day and upward; European plan, \$1 per day and upward.

It is advised that those desiring rooms at any of the hotels write direct to the hotel, stating what accommodations are desired, and having the above rates confirmed.

The reception and the annual banquet will be held in the Hollenden Hotel, the reception on Tuesday evening, September 21, and the banquet on Thursday evening, September 23.

Our members and friends in Cleveland extend to all our members and the vehicle trade in general, a hearty invitation to attend this convention, and assure all of a very cordial reception.

Even without our usual pleasant and profitable exhibition at these conventions, Cleveland has many attractions well worth your attention and a very enjoyable week can be spent there to the great advantage of every one.

By order of the executive committee.

Digitized by HENRY C. McLEAR, Secretary.

WORKING DRAWINGS CRITICIZED BY A LOCOMOTIVE ENGINEER

A locomotive engineer, who had recently accepted a post on a large motor-body building establishment, was heard to criticize the work of a carriage draftsman, pointing out that, although the plans and elevations were beautifully executed, the drawing, from the practical point of view, lacked information.

The trained engineer is constantly examining drawings which not only show the shape of the finished article and its various parts, but it is practically an accepted rule for the kind of material used, the number, location and type of fastening to be used, and other matters of direct interest to the workman to be stated on the drawing. The engineer mentioned above, no doubt felt that, although the draftsman accepted some of the responsibility for the constructional features of the job, he did not accept the whole—in fact many details which required more knowledge of the trade and a ripper judgment were left to the workman.

The body maker can usually please himself, when he is making and hanging a door, as to the actual size of hinge he uses, and the actual position in which they are screwed. He may not always be informed as to which pillar is to receive the hinges; and if he lets in the striking plates, or dovetails half an inch higher than he did on a former occasion, it is probable that only he or his mate will know anything about it, since there is nothing on the drawing to indicate the position of these fittings. The body maker often has a free hand in deciding the dimensions and position of much of the framing. He can put a panel batten in horizontally or vertically, in deal or in ash, and two, three, or four inches wide, according to his discretion. This, however, is not economical factory organization, but is a way we English have of doing many things. Those in authority cannot, or will not, make up their minds to assume the full responsibility to have a definite way of doing everything and seeing that it is done. Of course, if motor bodies and horsed vehicles in general had to be drawn full size, or to scale, with the same attention to detail as one expects to find with regard to any kind of engine or machine, then every carriage builder would have to increase his establishment expenses to cover the extra cost of producing drawings.

The present style of drawing would still have its uses for interesting the possible customer, while better and more elaborate work would be for the more effective control of the factory. If the motor engineer continues to encroach more and more on the preserves of what the motor body builder considers to be his legitimate business alone, then it is probable that some of the tradition of the engineer's shop will find its way into the carriage draftsman's office. The day is past, we hope, for anyone to express his ignorance of the metric system of measurement, still, at the same time, we should also be familiar with the use of decimals.

The drawings which government contractors have received from the War Office give a very good idea of the kind of working drawing which every firm should have in mind as an ideal. If only more firms produced a general assembly drawing after the government style, it would be a step in the right direction, a step which would mean something in the nature of the uplifting of the trade and a little added dignity. A working drawing, especially if drawn to scale, should be a piece of work worthy of preservation for reference, but in how many cases is this so? A drawing, in order to be finished, needs to be full of information; but it can be easily marred if dimensions, inscriptions, and so on, are slovenly written and badly spaced. Hand lettering requires considerable patience if a creditable formation of the letters and figures is to be achieved, but it is seldom considered worth while either by the draftsman or his employer. Even when a drawing is entered for a competition it is seldom graced with well-shaped lettering, and we suggest to the Coach Makers' Company that a competition for the best written specimens of lettering would be a test of far more practical importance to the student than attempts at heraldry.

The present time is considered by all as an opportunity for each of us to put our own house in order. The carriage building trade should make up its collective mind to make more creditable working drawings—drawings which shall reveal more thoroughness and more science, and leave less to the imagination, or the unasked, yet very convenient, help of others.—*Automobile and Carriage Builders' Journal* (London.)

WHAT DOES JITNEY MEAN?

Does jitney mean a nickel, or a ride, or a method of transportation, or a state of mind? Apparently it now means transportation, whether it means transportation for a nickel or not is disputed. Certainly the term "jitney," before the jitney boom arose, meant a small coin, a cent, five cents, a dime, or a quarter. As a boy in San Francisco, the writer has heard and used the term "jitney," meaning either a nickel or a dime. Cents in those days were unheard of on the coast. Later, in New Orleans, the term jitney was often heard, but there it seemed to refer to a nickel alone. May we advance a theory? The jitney, we think, originated in Louisiana in the Creole word, "jetton," meaning a counter, or poker chip. It did not necessarily mean a nickel, because this was in the days before nickels were invented, and in Louisiana until the time of the civil war circulated a miscellaneous assortment of Spanish, French and South American coin. Therefore, jitney meant the smaller denominations of these coin—sous and pesos and what not. From Louisiana the term naturally traveled to California. It has been in use there since the days of '49. How do I know? Three reasons: first, we infer that the word was in common use because we had learned it there; secondly, because several pioneers have told us it was used; thirdly, because in reading the old files of the *Overland Magazine* some time ago, dated in the seventies, the term jitney is used by one of the characters of a story of San Francisco life, the context of the story shows that this particular "jitney" was a quarter. A further proof that a jitney is not necessarily a nickel is that in early times no coin of less value than a quarter circulated on the coast.

So, Mr. Jitneur, when some opponent upbraids you for not being a true jitney because you may charge more than five cents, read him this article and crush him to earth. A jitney is a small coin, such as the great American public are now paying for trackless transportation.

Postscript—Alas, for trying to prove anything! We have just received word that a Canadian board of councilmen have decided that a "jitney" is five cents.—*Jitney Bus*.

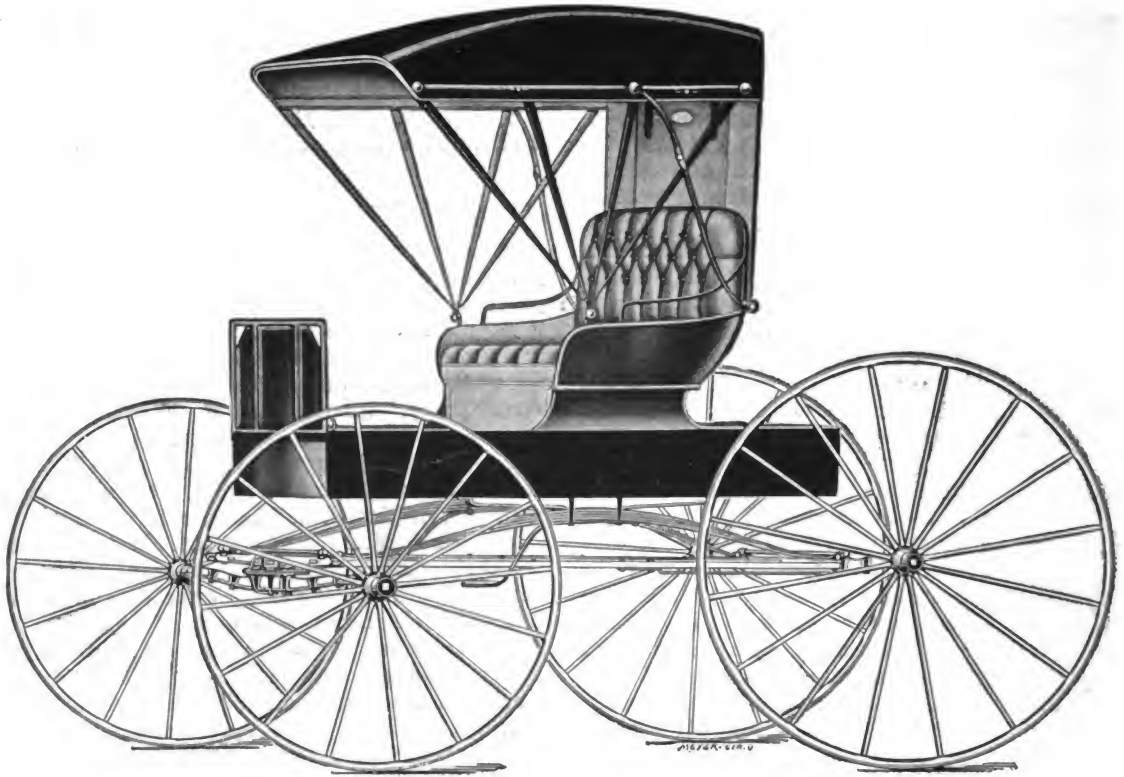
FIRESTONE EMPLOYEES ENJOY ANNUAL OUTING

Employees of the Firestone Tire & Rubber Co. and their families, to the number of 15,000, enjoyed their annual outing at beautiful Silver Lake, near Akron, on Saturday, July 31.

There was never a dull moment from early in the morning until late in the evening. Two of the big thrills of the day were produced by Barney Oldfield, racing in his 100 horsepower Fiat Cyclone, and De Lloyd Thompson, the aerialist, who exhibited his hair-raising feats of "looping the loop" and flying upside down. A base ball game in the morning between the factory and general office departments resulted in a scrappy contest for the coveted prize of \$50 to the winning team.

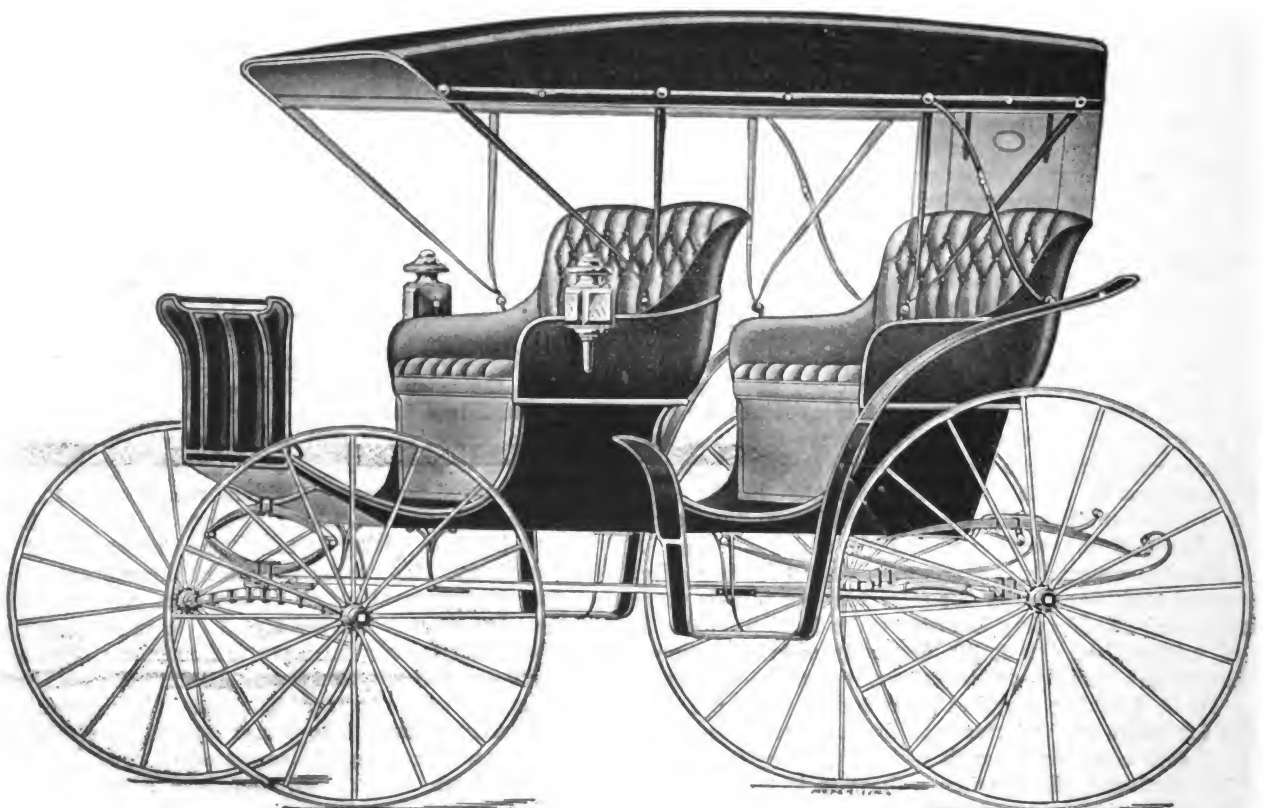
At noon everybody sat down to dinner, corralled by the time-honored custom of "the family basket" idea. The afternoon was replete with sports of all kinds. There were foot races and novelty races. The water sports furnished barrels of amusement. These sports consisted of rowing and swimming races for both men and women; and a special greased-pole-walking event. The ball game staged between the tire plant and rim plant divisions proved a battle royal.

Prize waltzes and bowling contests afforded ample amusement in the evening. Music for the day furnished by the Eighth Regiment Band, of Akron.



HEAVY PIANO BODY ON HEAVY CONCORD GEAR

Manufactured by
PARRY MANUFACTURING CO.
 Indianapolis, Ind.



JUMBO SURREY WITH EXTRA WIDE TWIN SEATS AND THREE-SPRING GEAR

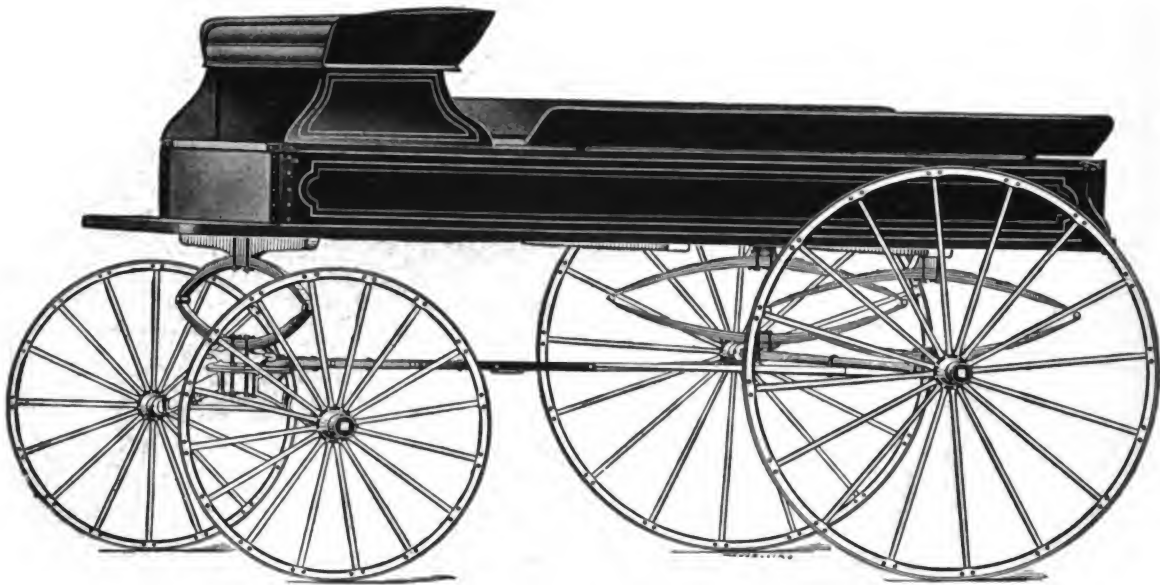
Manufactured by
PARRY MANUFACTURING CO.
 Indianapolis, Ind.



HALF AUTO RUNABOUT
Manufactured by
HIGH POINT BUGGY CO.
High Point, N. C.

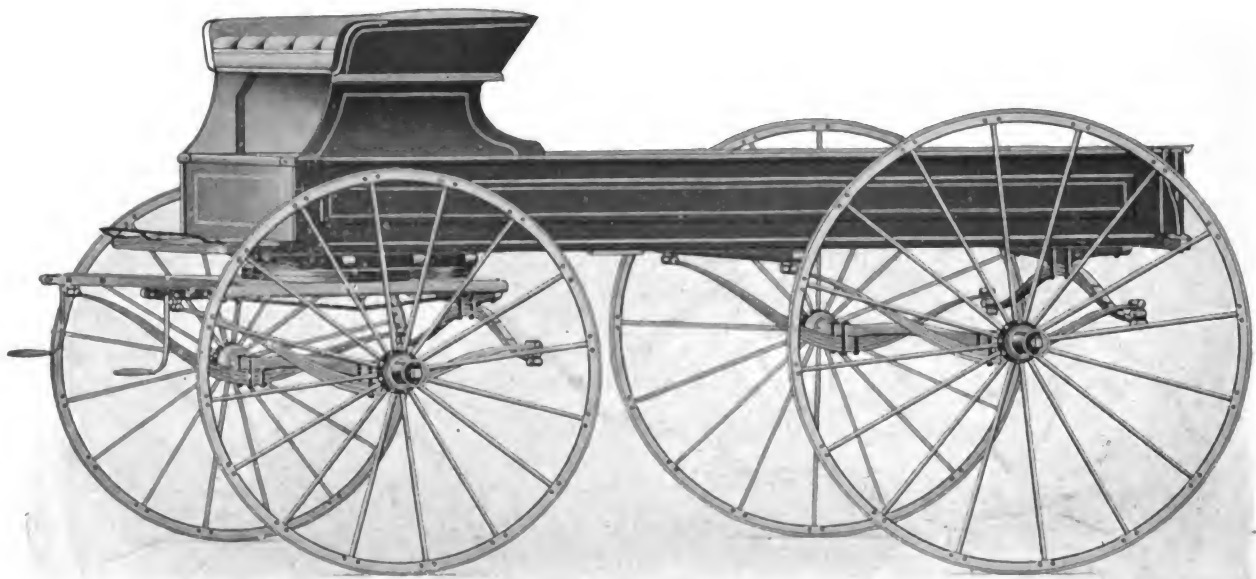


CORNING TOP BUGGY
Manufactured by
HIGH POINT BUGGY CO.
High Point, N. C.



LIGHT BUSINESS WAGON ON THREE SPRING CUT UNDER GEAR

Manufactured by
PARRY MANUFACTURING CO.
Indianapolis, Ind.



QUICK TURN DELIVERY WAGON

Manufactured by
STAVEL CARRIAGE CO.
Chicago, Ill.

HOW TO GIVE YOUR PROFITS AWAY

"I like that buggy, Jim, but that is more money than I had figured on. Can't you make me a little better price?"

Most carriage dealers have heard this and things like it so many times that they almost know it is coming before the prospect opens his mouth. Then Jim, and all others like him, of course, go into the elaborate explanation of why they cannot cut prices; why they must ask the same price of every customer for similar articles; how the price is made as low as is consistent with good merchandising at the outset. In this instance Jim explained that situation and the customer seemed to show signs of leaving.

"I don't believe we can make a trade," he said.

Nobody likes to lose a sale, of course, Jim among them, and he seemed to consider things for a moment, then said:

"Ninety dollars is the very least money I can take for that buggy, Tom; but I'll tell you what I can do."

So Tom renewed his interest and Jim explained how he would be able, in consideration of Tom taking the buggy, to throw in the harness he liked at \$12, instead of the \$20 that it was priced at. Of course, this meant that the total bill would go to more than \$100, but it also indicated that the dealer was making a concession to the buyer. This may almost seem to be a necessary surrender in the cases of many buyers who have not yet been trained to appreciation of the fact that good merchandising does not provide for reductions to order. At least Tom appeared to be mollified. He was getting something knocked off the selling price; his bartering appetite was tickled and he bought.

In the next half-hour Tom drove away with the new buggy hitched behind his old one and in it were these items:

One new whip, which cost the dealer an even dollar.

One new harness which the dealer sold at rock bottom cost.

One fringed lap robe, which cost the dealer 75 cents.

One coil of leather axle washers, which cost him 15 cents.

One dash pocket storm apron, imitation leather, costing one dollar.

One straw wheel-guard to protect the ladies' skirts, costing 25 cents.

One written guarantee, good for one year.

Most of the dealer's profit on the sale of one buggy.

The last item in the list is the tragic one. It is an item which puts Jim well up in the list of the dealers who will stand up and swear that the automobile has put the buggy on the toboggan and who will insist that there is "no money in buggies" any more. He, of course, did not read it that way; he probably thought he was doing a good piece of business and that the returns for the buggy were just as real in the way of profit as if the buggy as it came from the crate had been rolled out of the store and tied behind Tom's old vehicle. He figured that he was "out nothing" on the harness and that the \$3.15 worth of "free doings" were not important enough to make any real difference.

But Jim had found a good way to give his profits away, and unless Jim wakes up to what he is doing and calls a halt on his methods of distributing largess he will think less and less of the buggy business.

In the first place, he is doing nothing if not cutting prices. It amounts to the same thing, even if called another name. "The voice is Jacob's voice, but the hands of Esau." While Jim thinks that all he is giving away is \$3.15 of accessories, or when he thinks he is coming out even on the harness, he is as much mistaken as if he had figured his net profits on the buggy to be the difference between the cost price to him and the selling price to Tom. Not to mention the profits he should have taken into consideration, by the time he has added his overhead costs, which he cannot get away from, no matter what he calls them, to the whip, the lap robe, the storm apron, the wheel-guard and even the coil of washers, his premium gifts will run to considerably more than \$3.15. And to this he will have to add his cost of doing business on the harness.

Then Jim was doing a little "work" on the outside. Tom, it happened, lived in the same neighborhood with one of Jim's earlier customers, who had been promised "something" for every customer he sent to Jim's store. Now Jim is a good fellow and a man of his word, and the first time this first customer entered the store after the sale to Tom, he found a good buggy whip waiting for him—the same one dollar wholesale whip that went with the buggy—and there was a crisp two-dollar bill wrapped around the butt. Jim handed it over to the first customer with a wink at the bank note; they shook hands and, after a while, Jim, feeling good about his business acumen, went across to the drug store and bought himself a ten-cent cigar. He had just subtracted more than \$3 more from the legitimate profits on his buggy, and, not being a half-way man, felt he was entitled to celebrate with a cigar while his pipe cooled off.

To follow out this by no means improbable case, suppose for the sake of discussion that the cost of doing business in Jim's store is 20 per cent. It is not at all likely to be under that, judging by what we have seen of Jim's methods of doing business. Suppose that his buggy originally cost him, set down on the floor of the sales room, \$54. His cost of doing business, 20 per cent., means that he has got to subtract one-fifth of the selling price, or \$18 from the difference between the cost price and selling price. In other words there would be \$18 net profit on the buggy sale alone.

But off that \$18 has to come to \$2 in cash to the first customer; the dollar whip, plus the overhead; the overhead on the harness and also on the \$3.15 of free doings. Figuring on the basis of the buggy, the ratio of overhead to cost price would be 33 1/3 per cent. Then this is what Jim was giving away. Add them up: Take \$2 in cash; add \$1, for cost of the whip, plus 33 1/3 cents for overhead; add \$4 for overhead on the harness; add \$3.15 for the premiums and \$1.05 for the overhead on these items, and the result is obliged to be \$11.53. What has the dealer got left? The answer is, in words and figures: Six Dollars and Forty-seven Cents. And Jim spent ten cents of that for a cigar.

Of course, if Jim sold a buggy every day, or two or three a day on this basis, he might be able to get ahead, but he does not; neither does one dealer in a hundred. If he figured overhead into the case at all he might insist that the overhead could not be properly charged against the \$3.15 worth of premiums, since there was no particular effort expended in selling them. But he has stocked them; his money has been tied up in them, and they came out of the regular stock, have had to bear their proportionate share of the handling, shipping and all other costs, and so there could be little justification of the claim that they should not be asked to bear part of the burden. The same thing is true of the harness, and of the whip that went to the first customer credited with having sent Tom in for the buggy.

Now this is admittedly a more or less extreme case. But will the carriage dealer, who does not live in a house that is at least part glass, stand up and throw his stone in public? A glass window here and there is a most desirable thing. There are numbers of good and legitimate ways to frame them. A little "free doings" is a nice thing to lubricate a cash register with, but the dealer who uses such oil has got to be mighty sure where his bearings and oil cups are, or his profits will float off on greased ways. Getting back to cases, Jim has found a mighty good and a very certain system of giving his profits away. Pretty soon he will serve to "point a moral or adorn a tale" unless some good friend comes to his assistance and shows him the errors of his way.

There might have been a few things he could have done to give all his profits away, considering the buggy sale only. Suppose the original cost of the buggy had been \$65; that he first had priced it at \$115 and was selling at \$90 to close out a line. The difference between the cost and selling price, net, would have been \$3.33 1/3 and Jim's "profits" would have been \$8.20 less than nothing. Or Jim might have thrown in a better harness, that had cost him \$20 instead of \$12, and the overhead on

the additional \$8 of merchandise would have reduced the apparent profits of \$6.47 to \$3.80, which would not have taken a great deal of thought to throw in also. If Jim's reasoning on the \$12 harness was good, it surely would be good on the more expensive one.

And there is still another angle on the proposition, for Jim, by selling the harness at "cost" and figuring the gifts at cost, is depriving himself of his reasonable and legitimate profits on these articles as well. We have seen that Jim's paper profits and his costs on the buggy transaction, evenly divide the difference in the cost and selling price on the buggy—\$18 each way. In that view of the case Jim has not only gouged himself for the \$11.53 of overhead costs on the free doings and the harness, but has also thrown away profits he was entitled to realize on the merchandise involved. When he gives away merchandise he certainly has deprived himself on the sale of that merchandise to the man to whom he presented it, and when he foregoes a profit on a harness that profit certainly is gone forever.

What does this mean? Jim has, all things considered, given Tom not only \$11.53 out of the profits of the buggy, but he has also given him \$10.20 of the profits he ought to have received on the merchandise he added as premiums or the harness he sold at "cost." The other \$1.33 went, of course, to the first customer who got a whip with a \$2 bill wrapped around it. Then, instead of a profit of \$6.47, Jim is actually out \$5.06.

All of this may look thin to some dealers. It may look as though theory was being spun out to such a fine point that it is absurd. That is what a lot of business men in all lines think until some expert accountant representing the trustee in bankruptcy gets through with them. Then they see the writing on the wall that has been there all the time, though they shut their eyes to it. The case of Jim is hung on the presumption that he allowed the same percentage of profit on his accessories as he did on his carriages and that the ratio of profit to cost on this one buggy will be true throughout the stock.

As a matter of fact, this probably is not his practice any more than it is the practice of the average dealer in carriages, lamp chimneys, or what not. "Whatever the traffic will bear" may or may not be the rule, may be good policy or may not be; that is another question. Here, however, we have seen a carriage dealer deliberately throwing away his profits. The trouble with such a dealer is that he does not appreciate the necessity of making every piece of his stock contribute to his profits and bear its proper proportion of the cost of doing business. Leaving out of consideration the ethics shattered in this flagrant case of price cutting, which is what the buggy sale amounted to, and look at it only on the basis of dollars and cents, it is a sad proposition. It also has spoiled Tom as a customer, besides having put an idea in the head of the man who sent Tom in that will rankle when he buys something again.

Probably you would have to hunt a long time before finding a dealer who would go to the elaborate pains Jim did to impoverish himself and ruin his business. Fortunately, such a case is exceptional. But every dealer, at one time or another, will have to handle propositions much the same as Jim was confronted with. Every dealer finds premiums an aid to sales. They have their proper place, but when they are used the dealer who uses them should know what he is about. This means study of costs. Only by such study can the dealer know what he is doing, and only by living up to what such study shows him can he be sure, whatever else may happen, that he is not giving his profits away.—Carriage Dealers Journal.

EXPORTS OF HORSES AND MULES

Recent figures issued by the United States government place the value of horses exported during the month of May at \$8,169,267, and during the eleven months ending May 31 at \$55,953,115. Mules exported during May, this year, were valued at \$2,705,827, and during the eleven months ending with May at \$10,183,841.

WHAT THE AUTOMOBILE IS TEACHING THE CARRIAGE MANUFACTURER

By George Frank Lord

The decrease in the sales of carriages and buggies has caused quite some alarm among the manufacturers. Five years ago the carriage business was at its height, but each year's reports since that time have shown it falling off.

Many reasons have been given for this, but the two chief ones are price competition and the automobile.

The manufacturers of carriages and buggies, proceeding on the false theory that they had to get their carriages low priced in order to sell them to the farmer, ran a neck to neck race to see who could turn out the cheapest carriage, until they finally got the buggy and carriage in disrepute. The farmer was looking for a good thing, and when the automobile came along, the price did not stop at least 75 per cent. from buying automobiles.

While the carriage has been, and in fact still seems to be a farm necessity, the automobile costing in nearly all cases several times as much as a carriage, made an inroad into carriage sales that was indeed surprising.

Farmers demand quality and service. They have the money and are willing to pay the price.

Many farmers now have automobiles, many of which were bought on the spur of the moment, the purchaser thinking of the honor and the novelty of being the first one in his locality to have a "machine." The "machine" has answered for many purposes, but to many a farmer there is something lacking. For his trips to town and other errands that have to be made in haste, it has been "Johnny on the spot," but for a care-free outing or a neighborly visit, the carriage is the desired conveyance.

One reason why a carriage seems to own a place on the farm is because every farm has a horse and the "once in a while" carriage trips will not interfere with its other uses, and, of course, it has to be fed whether used or not, so its additional uses do not increase the cost or upkeep.

The city man can't have this advantage, for owing to the small area of his yard, he in practically all cases has no space for a stable, and it is not very pleasant to have to walk to a stable some squares away every time one wants to take a ride or give the horse attention. Of course, if he has money enough he can have some one do these duties for him, but every one isn't financially "fixed" that way. It therefore seems to be the tendency for the city man to take to the automobile, and the farmer to have an automobile for business purposes and a carriage or buggy for social purposes.

With facts pointing as they do, it is up to the carriage manufacturers to awake and bring their industry back to its old position. To do this, they will have to come back to their old standard. Better wearing material will have to be used, not the kind that looks good but wears badly. This is especially true of the upholstery. Care should be taken to avoid cheap split leather, as it is not guaranteed and usually cracks or peels within a year.

Motor quality leather substitutes are stronger than split leather, because the latter is merely a sectional sheet of the weak flesh side of a hide, whereas the former is waterproof and washable and is guaranteed for a year against cracking or peeling.

The waterproof feature is of importance, for carriages have to go through many severe rain or snow storms. Besides, in the "dry spells" they are going through dust and will have to be cleaned frequently.

Very truly yours,

GEORGE FRANK LORD,
Du Pont Fabrikoid Co.

Jarrett Gruders, dealer at Vincent, Ia., has sold out his implement and vehicles store to Scott & Van Horn, of Ft. Dodge, a real estate firm, which will operate the business. Mr. Gruders will go into implement specialty lines.

HOW THE WAR AFFECTS AUTO INDUSTRY IN GREAT BRITAIN

It is not easy to write on the present position of affairs in the automobile world in Great Britain, partly because the picture is as everchanging as the chameleon, and partly because, since the government order which has led to the taking over of some of the most important factories, those works have been completely shut, barred and sealed to all outside enquiries. This order came into force March 15, chiefly as the result of labor troubles. Strikes and this order have introduced the public to the word output, which, formerly the keynote of the manufacturing engineer, has now become the shibboleth of the man in the street. Two main factors have affected the motor output of Great Britain: 1, shortage of labor; and 2, strikes.

In comparing British automobile output before and during the war, says the London correspondent of *Automobile*, one can only generalize, for there are all sorts of conditions to throw out any accurate computation. Many factories, as, for instance, the old Argyll works, which have been bought by Armstrongs, are turned on to ammunition making. Others, like Wolseley, Daimler, Sunbeam and Austins are making aeroplane engines, some of them of the eight-cylinder V-pattern, others of the Gnome rotating cylinder type, others with twelve cylinders 90 x 150 mm. arranged V-pattern, these last being intended for sea planes.

Again, private car manufacture is being ousted by the call for trucks. Some firms, like the Star, that did comparatively little in this line, have been turning out a lot, some I believe for Russia (Austins have also done a vast amount for the Russian government), while others like the Daimler or the Wolseley, that made commercials in considerable numbers, are turning them out in far greater numbers. And the demand does not stop with the truck; for instance, one big midland firm is making big sleeve-valve engines for gun tractors. Then again another firm is engaged in armoring and fitting up a lot of Pierce-Arrow commercial chassis for use with armored cars and to carry a gun. Again, to give another example of how difficult it is to obtain a basis for estimating the output of the present, let me mention the case of a commercial truck making firm with an output of 12 or 14 trucks a week in normal peace time; at present they are not turning out a single car, but are devoting themselves to the making of spare parts.

This demand for spare parts assumes considerable dimensions. For instance, for every 20 chassis the British War Office requires one extra steering gear and housing; for every ten chassis, one water pump, one set of holding-down dogs for tappet guides, one gasoline tank, and one set of selector mechanism have to be supplied; for every five chassis one complete set of radiator tubes, one set of gearbox ball bearings and thrust washers. Every three chassis have a complete spare radiator; every two chassis a set of big end and crankshaft bearings. Each single chassis has its spare set of pistons with wrist pins and rings, and two sets of liners for shoes for the foot brake.

Output, 35,000

The normal British output of makers of private cars, light vans on pneumatic tires, in fact, all vehicles having the characteristics of private car chassis, may be put at not more than 30,000 to 35,000. It is impossible to give a closer estimate as no figures are available. Whether commandeered lock, stock, and barrel, or left alone, the total output of private cars from British factories at the present time scarcely exceeds one-third the normal for this time of the year, the rest of the industry's energy being devoted to war material, either as contractors or sub-contractors. On the known weekly output of all the leading commercial automobile works in Great Britain the normal annual output of heavier vehicles may be placed at 10,000 to 12,000, and careful inquiries point quite decidedly to the fact that some 40 per cent. more stuff is now being turned out than before the war.

The output of the big private car-making works, like those

of the Daimler, Sunbeam, Lanchester, and Rolls-Royce, have been practically taken over by the government, while even considerable firms that are not requisitioned, such as the Rover and Swift or Standard companies, at the time of writing are devoting somewhere about two-thirds of their work to government output, as sub-contractors; one is making gear boxes for a lorry firm; another back axles, a third certain engine parts; while at least one is doing some ammunition work.

Talking of ammunition work, the Vauxhall company has put up an ammunition factory quite separate from its motor works, a performance that will be regarded as quite a feat of construction at any other time than the present.

In private car output the firms most affected have been those making cars too small to do what the government wants. The smallest cars taken have been the 16 h.p. Sunbeam, four cylinders, 80 x 150 mm., and the 16 h.p. Vauxhall, 90 x 120 mm. In both cases these have been mainly used for ambulance work, though some are employed as staff cars. For most of the staff work something bigger is wanted, like the 25 h.p. Vauxhall, 95 x 140 mm., or the 20 h.p. Daimler, 90 x 130 mm.

Incidentally, no car with less than four speeds has been officially bought, though, of course, odd purchases of all kinds of cars have been made under individual pressure of circumstances. If we except an experimental order for 60 light cars to be used as two-seaters for some purposes not yet known, no order has been given in cold blood for anything smaller than the Sunbeam.

The 20 h.p. Daimlers, already mentioned, are being turned out, some as complete open cars, some as sort of light vans to carry 1,120 lbs. of material or men, for which there is seating accommodation. Though the Vauxhall people have supplied 16 h.p. they are at present devoting themselves wholly and solely to their 25 h.p. cars, 95 x 140 mm., and they, Wolseley and Daimler, are supplying some big cars for staff purposes; in some cases the staff cars have their seats so arranged that the car interior can be used as a sleeping apartment for staff officers. The royal naval air service is absorbing a goodly number of cars, mostly Talbots, and though a good few such cars as Vauxhalls are used a lot of these are armored. Rolls-Royce, Lanchester and Austin, among others, are turning out staff cars and armored cars, the latter in no small measure for Russian requirements. Humbers are making field kitchens, which is an engineer's rather than a body maker's job. Arrol Johnson has for a long time past been making such parts as maxim gun tripods, and Napiers are on gun parts, etc.

All Three and Four-Tonners Commandeered

Further, practically all the output of three and four-ton trucks throughout the country has been commandeered, for be it realized that the three-ton subvention type of the British army to all intents and purposes is a four-tonner for civilian work, while their 3,360-pound class is capable of taking anywhere from 2 to 2½ tons. Indeed, many are building in no other sizes. Some few five-tonners are being taken, but not many; they are too unwieldy, except for special purposes. The tendency, indeed, points rather to the absorption in the future of smaller types, such as two-tonners.

But though demand exceeds the labor supply for every firm of any effectiveness in the country manufacturers are not without troubles. It is true that, selling only to government, they can reduce their selling costs, but labor dearth is having its effect, and the rise of price in material is feeding on its own growth. Yet in spite of this, automobile makers are being paid less by the government than they would be by their agents.

But with the substitution of many public buyers for a single government as customer dealing direct with the manufacturers, the dealer is having a very bad time. A good few of the smaller and less intelligent have already gone under, those who survive adapting themselves to present-day requirements. For instance, they are devoting more attention to the commercial vehicle, and some, realizing the unsatisfactory state of railway transport, for the railways have been taken over by the government, are contracting for motor transport. In some few instances,

however, which have come to my notice they are handicapped with a lack of proper knowledge of working costs.

Price Question on Second-Hand Cars

The question of the second-hand vehicle is likely to assume proportions. Quite recently there was a trade debate on the possibility of fixing a minimum price for second-hand cars, though it was generally thought to be impracticable to saddle the public with restrictions. It is a question, however, whether the same impracticability applies to battle-worn cars after the war. The whole matter will lie in the hands of the government, and though not generally expressed, it is felt that the government should treat with every consideration the interests of the automobile trade to whose help they owe so much in this campaign.

So far the most practicable suggestion is one advocating that since each manufacturer's reputation is dependent on the performance of his vehicles, each manufacturer should be appointed by the military authorities as agent for the sale of his own second-hand war vehicles. These would be turned over to him on the understanding that they would not be sold below a certain minimum price, and that no vehicle would be sent out without the manufacturer's guarantee of its sound condition.

Dearth of New Cars

Even now the second-hand car problem is with us, but at present rather from the opposite point of view, demand exceeding supply. It is said that the dearth of new cars, especially in the larger sizes, is sending up the price of the second-handers. The other day a man in the trade said he had advanced 17½ per cent. Comparison of the prices certainly show a general rise, though in some cases, as, for example, Fords, 1915 second-hand prices strangely enough appear down on those of last year. From a careful comparison of prices of similar second-hand cars of this and last year 7½ per cent. advance for 1915 appears much the more correct general figure. We have heard a good deal about a coming car famine, but with the general public going very carefully in financial matters, and some 2,000,000 additional men away on military duty, this possibility is likely to be overrated.

ELECTRIC VEHICLES IN EUROPE

The Electric Vehicle Committee of the Incorporated Electrical Association, of London, furnishes some interesting information concerning the progress of the electric vehicle in European cities.

Electric vehicles are used to some extent for refuse collection in cities on the continent. Each has a capacity of 15 cubic yards, which, since the local refuse averages some three cubic yards to the ton, makes the total load of the full vehicle not less than five tons. The vehicles perform their work during the night hours, each covering about 25 miles nightly, with an energy consumption per vehicle mile of from 1.5 to 1.7 units. This system of collection was adopted as the result of a very careful trial made by the civic authorities which showed that considerable economy would be obtained by the use of electric vehicles.

By reason of its smooth and silent running, the uniform and jerkless acceleration, the electric is an ideal vehicle for ambulance work in our towns and cities. It has for some time been employed for this purpose by the City of London Corporation, by the Port of London Authority, and the Metropolitan Asylums Board. While the advantages just now mentioned are all important ones for this sort of work, the feature of economy should not be forgotten; while the promptitude with which calls may be answered is just as valuable an attribute as in the case of Fire Brigade Service. The simplicity of operation also enables several ordinary attendants to be trained to drive, so that a call may never find the van in want of a driver.

The electric vehicle is in use on the Continent in connection with street cleaning and brushing machines, and for watering, one important Continental city having about 30 in use. In the

city referred to, each electric watering van waters about 49,000 square yards of road surface per day of eight hours, as against 30,000 yards, the best average of a horse-drawn van. The electric vehicle is also employed for carrying materials used in the making and repair of roadways, and a three-ton wagon with tipping body has just been put into service for this purpose by the Corporation of Ipswich. In reality, this wagon will be a "double-purpose machine," since the tipping body is removable, and can give place to a water tank (which is now being constructed) to enable the vehicle to be used for street watering.

It has been suggested that an electrically-driven road roller would be an improvement upon the noisy steam roller generally in use. Although as far as the committee's knowledge goes, no electrically-propelled rollers have yet been introduced, there appears to be obvious advantages in that method of working and no difficulties in applying it. As weight is an essential requirement, a battery of as large capacity as necessary could be fitted.

GAIN IN AMERICAN SHIP CARGOES

A considerable increase in the proportion of the United States commerce carried in United States ships has been one result of the war in Europe.

Figures compiled by the Bureau of Foreign and Domestic Commerce of the Department of Commerce, show that the increase will probably reach \$100,000,000 in value during the present fiscal year as compared with last year.

Carried Under Our Flag

From August 1, 1914, to March 31, 1915, the value of American imports and exports was \$2,797,000,000, of which \$363,600,000 was carried in American ships, or 12.64 per cent.

During the corresponding period of the year before the total value of imports and exports was \$2,960,000,000, of which \$246,800,000, or 8.34 per cent., was carried in American bottoms.

British vessels are still transporting about one-half of America's foreign commerce. The war has cut down the value of the total, however.

England Predominates

A table showing the value of American foreign commerce, in millions of dollars, carried in vessels of each nationality during the eight months ending March 31, is as follows:

Vessels	Domestic Exports		Imports	
	1914	1915	1914	1915
American	111.7	178.7	135.1	175.0
British	899.1	893.9	557.0	430.9
German	193.8	0.2	163.0	10.3
Norwegian	48.2	113.3	39.0	68.0
Dutch	56.5	63.9	44.9	90.9
French	46.6	84.5	81.6	45.4
Italian	28.9	50.8	25.6	33.6
Japanese	19.8	20.7	37.7	41.0
Austrian	25.5	0.0	15.2	1.6
Belgian	9.5	6.2	24.3	2.3
Swedish, Danish and other....	60.9	145.0	30.3	53.6
Cars and other land vehicles..	200.4	185.4	105.6	101.5
Totals	1,700.9	1,742.6	1,259.3	1,054.1

The exports in American bottoms since the war began have increased 60 per cent. in value, while the tonnage of the vessels carrying them has increased only 9 per cent. Since the war began 142 foreign built vessels, of 500,705 gross tons, have been registered as vessels of the United States.

CHICKEN AND WAFFLES FOR C.H.A.T. DINNER

Wednesday night will be C. H. A. T. night at the C. B. N. A. convention in Cleveland the week of September 20. The entertainment committee has selected the Hollenden Hotel for the occasion because of its being convention headquarters. A chicken and waffle dinner will be served and the committee will provide entertainment to heighten the enjoyment of the occasion. The speaking which will follow will be of the usual high quality.

MOTOR CAR PRODUCTION

American and English Production Methods Compared

A few days ago I was escorting an American motorist through one of the largest of our motor factories, when he inquired what wages a man he saw looking after one of the machine tools would earn. I told him probably 10 pence an hour.

"How much is that a day?" he asked.

"Something under two dollars. I suppose in America the same man would get three times as much?"

"Why, yes; about five dollars a day." And then he added, "Say, this puzzles me. How is it, with such low wages, you people in this country cannot knock spots off us Americans on your prices?"

I told him we did not think the wages mentioned were so particularly low, when we compared them with the figures paid on the Continent. And this made him more than ever puzzled as to why the Continental firms could not wipe American manufacturers off the face of the earth in competition.

Many things in that factory surprised him. Some agreeably and some, I could plainly see, otherwise. A little later on we came to a man drilling holes in the bottom half of an aluminum crankcase. He was bringing the work into position under the tool and drilling each hole separately, one at a time. This astonished my friend immensely.

"My!" said he, "Why, in America they would do all that lot at once," and he asked how it was we did not do the same over here.

When I explained things to him a bit, he saw the point, and doubtless many others, unacquainted with manufacturing methods, may be interested in the explanation I gave him. Certainly, if the true inwardness of such things were better understood by the public, says Motor, England, we should hear less of the newspaper tirades we occasionally get from insufficiently informed, but doubtless well intentioned people, and from mere politicians, who cannot see how such things as tariffs, for instance, can in any way affect the conditions of an industry and when British producers appear to be losing ground against their foreign rivals, simply denounce the manufacturers as being ignorant of their own business and behind the times in their methods, and shout to them: "Mend your methods and do not bother about tariffs, and you will be all right."

In this particular piece of work there were probably 20 holes to be drilled and the operations of centering the work under the tool and passing the drill through the metal, probably took three minutes. Now, here was a man doing each hole separately, and what my friend pointed out was that, whereas he was working with only a single drill, in America he would be working with a cluster of drills, each positioned to make its proper hole in the work, and, when the work had once been accurately placed for the operation, the whole of the 20 drills would be brought down together, the actual operation of drilling the entire 20 holes thereby occupying no more time than the man he was observing took to pierce a single one. On the face of it, of course, all other things being equal, the British manufacturer in whose works the observation was made was working in a most wasteful manner by employing methods by which it took a man a full hour to pierce those 20 holes, when, allowing for a little extra time, perhaps, in the first positioning of the work, with a different tool equipment, it could be done in five or six minutes. Indeed, my friend went into figures, and showed that, piercing these holes, one at a time and paying a man 20 cents an hour, the holes cost 1 cent (one half-penny) each to drill, and the labor on this entire piece of work cost 10 pence, whereas, if the man had been provided by his employers with such a tool as he would have to work with in an American factory, he would do the whole work for a penny, and, allowing for the wage rates in the States being approximately three times those ruling here, even there the cost would be cut three pence, thus showing a saving to the manufacturer on the labor cost of this one item alone of over

2 shillings in America or 9 pence here, counting British wages. And he observed that this was only a single operation of the many hundreds of operations required in the production of a motor car, so why we did not just pick up the pennies all around and fill buckets with them he could not understand at all.

The explanation I gave him was this: The firm in question, although one of the largest manufacturers in this country, was producing four or five different models of engine, making only from, approximately, 300 to 1,000 of any one type and averaging, perhaps, 600 of one particular model. Now, taking the latter figure for the purpose of calculation, I showed him that, while the machine-tool he saw working could be employed equally well in drilling the holes in the crank cases of each of the four or five models, such a tool as he had seen in American factories would require to be built specially to drill the holes in a single model only. This tool might, very possibly, cost 200 pounds sterling to install, and I showed him that, if installed and completing its work in, say, six minutes per unit, or allowing only five per hour, it would finish off in a fortnight the entire number of crank cases required in a twelve-month, and would, therefore, be lying idle more than eleven months out of the year, occupying space in the workshop and, so to speak, "eating its head off" doing nothing; while, allowing 5 per cent. interest on the capital and only 10 per cent. depreciation, without reckoning anything for its share of rent, of floor space, etc., the cost to the manufacturers would figure out at 30 pounds sterling, whereas the saving, even at 9 pence per unit, would be but 22 pounds 10 shillings; so that, on this calculation alone the manufacturer would be out 7 pounds 10 shillings. Further, as the tool was only capable of doing that one particular piece of work, if the next season's design called for an alteration in the part operated upon, the whole or a great part of the machine would be practically scrapped, to say nothing of the fact that, if he were to use such a machine, the manufacture would have to carry his whole stock of crank cases through the year instead of spreading them over the period, thus locking up a considerable amount of capital, the interest upon which would have to be reckoned with.

Next I pointed out to him that, on a production of 15,000 per annum—which is quite an ordinary output of a single model for any of the leading American manufacturers—that machine could be kept steadily employed for the whole year. While, at a rate of saving of only 7½ pence per piece, the gross saving at American wage rates over the British method and wages would be 468 pounds 15 shillings, an amount which would allow the tool, costly as it would have been, to be thrown away as scrap at the end of the year if need be and still leave the manufacturer over 250 pounds to the good, while the saving to the manufacturer at American wage rates would work out at something like 1,500 pounds sterling.

My friend then began to see things in a different light, and remarked that it was evident from what I had said that the principal factor governing the situation was the quantity produced, on which I assured him that he had "hit it in once." Here is, indeed, the secret of the success of American methods in reducing the cost of production of the goods and at the same time paying a rate of wage several times that which pertains here. Indeed, it is this high wage rate which practically compels American manufacturers to adopt such methods if they are to compete at all with Europe. There is no mystery about it. And there is no ignorance, or backwardness, or want of enterprise in our manufacturers. They are producing by methods which, under the quantity and wage conditions under which they have to work, give the best results. Apart from the fact, however, that American producers of motor cars have the largest market in the world all to themselves, tucked in safely behind that tariff barrier, they have one factor of the most important character which we have not, and that is enterprise—not on the part of the engineer-organizer, but on the part of the financier, and this greater capital enterprise may be doubtless accounted for by the greater protection for capital

which the tariff wall provides. American manufacturers of motor cars did not begin producing in quantities they are now doing all at once. There was a time when they were producing no more than we are today, and if we take the Ford car as an illustration, as probably the highest development of American producing methods today, it may be pointed out that the first manufacturing program laid out for the production of that car was not for the 300,000 turned out today, but for 10,000 vehicles only. At that time, however, probably no manufacturer, either in America or here, produced more than a tenth of that number of any one model, and the Ford program could then have been carried out just as well in England as in America, for at that time even farseeing American producers thought Ford was mad in laying out to produce such a large number of a single type. Yet, considering the prices ruling for cars in those days, in the States as well as here, had the same scheme been adopted in this country, the American markets, as well as those of Europe, would have been at the mercy of the producer who had done so—despite the tariff wall—until such time, of course, as the American producers tumbled to what was up and adopted the same methods. But here was the point. Ford was able to find capitalists to back him in his enterprise of producing 10,000 cars before he had sold them, while the attitude of British capital was at that time—and still is to a large extent—exemplified by the remark made to me 12 or 14 years ago by the then Mayor of Coventry: "Motors! Motors!" said he. "Would you ever sell any if you built them?"

Depend upon it that, given the opportunity and the capital, the British producer, not only of motor cars, but of anything else, is fully the equal of his American competitor. But to reduce the cost of labor on hundreds of individual pieces means a very high initial expenditure, and this is the reason why so many of the lesser American makers today manufacture little in their own works, their cars being very largely "assembly propositions." It comes, in short, to a system of co-operative working; for whereas car manufacturers here, for the most part, pride themselves on making their own engines, let us say, and make them, of course, in the same quantities as their cars are produced, and as the British manufacturers of "trade" engines produce only in approximately similar quantities—in America, by reason of having the work of engine manufacture to do for a dozen different car makers an individual firm of engine builders is enabled to pay itself out to produce, say 50,000 or 60,000 engines to one pattern, and can, consequently, adopt all those methods of special tool arrangements which go to reduce cost, and, as a result, can actually supply the different firms using their engines at prices less than they could produce the engines for themselves in their own works, in the quantities in which they could use them.

HOT WEATHER RULES

The Boston Work-Horse Relief Association has sent out the following list of printed rules for owners and drivers of horses:

1. Load lightly, and drive slowly.
2. Stop in the shade if possible.
3. Water your horse as often as possible. So long as a horse is working, water in **small quantities** will not hurt him. But let him drink only a few swallows if he is going to stand still. Do not fail to water him at night **after** he has eaten his hay.
4. When he comes in **after work**, **sponge off the harness** marks and sweat, his eyes, his nose and mouth, and the dock. Wash his feet but **not** his legs.
5. If the thermometer is 75 degrees or higher, wipe him all over with a damp sponge. Use vinegar water if possible. Do **not** turn the hose on him.
6. Saturday night, give a bran mash, lukewarm; and add a tablespoonful of saltpetre.
7. Do not use a horse-hat, unless it is a canopy-top hat. The ordinary bell-shaped hat does more harm than good.
8. A sponge on top of the head, or even a cloth, is good if kept wet. If dry it is worse than nothing.

9. If the horse is overcome by heat, get him into the shade, remove harness and bridle, wash out his mouth, sponge him all over, shower his legs, and give him two ounces of aromatic spirits of ammonia, or two ounces of sweet spirits of nitre, in a pint of water; or give him a pint of coffee warm. Cool his head at once, using cold water, or, if necessary, chopped ice, wrapped in a cloth.

10. If the horse is off his feed, try him with two quarts of oats mixed with bran, and a little water; and add a little salt or sugar. Or give him oatmeal gruel or barley water to drink.

11. Watch your horse. If he stops sweating suddenly, or if he breathes short and quick, or if his ears droop, or if he stands with his legs braced sidewise, he is in **danger** of a heat or sun stroke and needs attention at once.

12. If it is so hot that the horse sweats in the stable at night, **tie him outside**, with bedding under him. Unless he cools off during the night, he cannot well stand the next day's heat.

The association also publishes Stable Rules and Drivers' Rules. Copies of any of these rules will be sent free, on application to the association at 15 Beacon street, Boston, Mass.

FIRST ELECTRIC AUTOMOBILE IN EDINBURGH

No vehicles driven by electric power have been in use in this part of Scotland for pleasure or business.

It is noteworthy that the Edinburgh corporation is the first purchaser of an electric vehicle in this district, and still more noteworthy that it is the intention of the committee in charge of the municipal electricity plant to encourage the introduction of electric trucks, vans, and other cars. The committee has acquired, through a London agency, an American-built electric lorry or wagon, having a carrying capacity of 1½ tons and a guaranteed speed of 11 miles per hour on the level and five miles per hour on a gradient of 1 in 10 with full load. The accumulators are of the Edison type. With a full charge the lorry is capable of traveling 40 miles with a load of 1½ tons and 50 miles with a half load. The control is effected by one handle fixed to the steering wheel, which alters the speed of the motor, so that there are only the controller handle and the brakes to manipulate.

The electricity required for one full charge is about 35 units. With electricity at 1 penny (2 cents) per unit, the cost per mile will be slightly less than 1¼ cents on moderately level roads with good surface. The cost of the lorry complete is £695 (\$3,382.21).

The committee has undertaken to supply electricity for the charging of such vehicles at the rate of 1 penny per unit and has made arrangements not only for charging but also for storing lorries in the municipal electric stations. It is considered not unlikely that the result will be a fair demand for commercial lorries and vans, says Consul Fleming, also electric cars for pleasure and professional purposes.

IMPORTS AND EXPORTS FOR MAY

During the month of May our imports amounted to \$142,284,851, as compared with \$164,281,515 for the same month last year. Our imports for eleven months ending with May amounted to \$1,516,474,600, as compared with \$1,736,396,207 for same period last year.

Exports of domestic articles during May amounted to \$269,336,222, as compared with \$157,492,718 in May, 1914. The exports of foreign merchandise from this country in May were valued at \$4,881,920, as compared with \$4,239,901 same month last year. During the eleven months ending with May, 1915, our exports of domestic articles amounted to \$2,452,033,414, as compared with \$2,175,578,565 for same period 1914. Exports of foreign articles during those eleven months of 1915 were valued at \$48,008,510, as compared with \$31,928,530 in 1914.

The value of horses exported in May, 1915, was placed at \$8,169,267, and mules at \$2,705,827.

The total value of horses exported during the eleven months was \$55,953,115, and of mules, \$10,183,841.

THE CYCLECAR COLLAPSE

A writer in *Printers' Ink* attempts to give the moral—or to use a popular but perhaps less correct word—the “psychology” of the cyclecar boom and its collapse.

He first shows how this boom went up like a rocket and came down like a stick, and then gives the reason for it. He adds that he knows personally of one warehouse that contains a half million dollars' worth of unassembled cyclecar parts, and sums up the reason therefore as follows:

“The costly failure of a whole industry is attributable to one fact: The cyclecar was absolutely out of joint with an equally well advertised and consequently well known personal transportation market.”

What he means, we suppose, is that in view of other well-advertised and satisfactory automobiles at a low price there was no market for an innovation that was not considered as attractive. But there was another reason for the temporary—possibly the permanent—failure of the cyclecar. In cases where its design and construction were correct and it would have met a well defined public need, it was not handled in a judicious way and where it was handled judiciously it did not meet the public need.

The original idea of the cyclecar was the correct one. This was something far lighter in weight than the regular automobile runabout, and consequently a car that could be run and stored at less expense. With these requirements achieved it did not matter much whether the price was a little more or a little less than that of the low-priced cars of the regulation pattern and use.

Of course, there is but one way to secure the essential light weight and the necessary strength and stability, the tread must be made much narrower and the standard of 56 or 58 inches. We believe it might be as narrow as 30 inches. To prevent overturning with such a narrow tread, it would be necessary to use wheels of large diameter, say 38 or 40 inches, and by underslung construction obviate its liability to overturn. Of course, this narrow tread would enforce tandem seating for which there was some objection on the part of the public. Yet there is a certain per cent. of tandem seating in all vehicles where there is more than one seat.

But construction of this sort would practically reduce the weight of the car one-half, it would reduce the tire wear one-half, the lubricating oil one-half, the storage charge one-half, and the repair bills practically one-half. This having been accomplished the automobile would be within the means of a large class who do not now feel they can afford it solely on account of its expensive up-keep. Quite likely this class is as large as the entire class who already own automobiles.

As to the price of the cyclecar, it matters little whether it be more or less than the cheap standard runabout. The main thing for consideration is the cost of up-keep. Between a maintenance cost of \$20 a month and \$10 a month, there is a difference of \$120 a year, or the interest on an investment of \$2,400 at five per cent.

There has been and will be a demand for a cyclecar built according to the foregoing outline. Any manufacturer who will perfect it and cleave to it, despite the slight objections and difficulties experienced by all who leave the beaten paths, will find a large market ready to purchase it.—Automobile Dealer and Repairer.

THE OLD THOROUGHBRACE COACH

A city coach builder, after an interval of 30 years, found himself again on the box seat of a mail coach. The driver was an old acquaintance. There was wide scope for the exchange of reminiscences between them. Neither could well avoid talking shop. The coach builder had run his eyes over the coach. It was mounted on three elliptic springs, and though in the arrangement of the seats it was similar to the old time eight passenger Cobb's coach, its make up showed effects of the

silent revolution of 30 years. The thoroughbraces had gone, and so also the framed top which had given place to a motor extension hood.

When the changes were regretfully mentioned to the driver the latter, “Mick” by name, was unsympathetic. “No,” said Mick, “I don't lament the change. The thoroughbrace coach did good work in its time, but it has been properly superseded. It was an uncomfortable vehicle, and I never wish to mount one again. Did I ever tell you how I made the clergyman kiss the lady?”

“No! then I shall tell it. It was this way. I was driving a thoroughbrace coach. I had three passengers. In the coach, with his back to me was a clergyman and he and a stout lady faced each other. My companion on the box was a taciturn German. Nearly an hour passed and there were scarcely a dozen words spoken between the passengers. My best yarns had fallen flat. We were approaching a spot where a broad gutter crossed the road, so I said to the German, ‘Would you like to see me make the parson kiss the lady?’ He grinned and said it would be funny. I warned him to watch. In a moment we were in the gutter. The coach lurched and threw the parson right into the lady's lap. I then remonstrated with him for kissing the lady and told him that it was very wrong. That broke the ice. The clergyman protested his innocence. The lady explained and exonerated him, and I apologized. The two laughed at my innocence, and the German laughed at my cunning, and we thus became and remained a merry party to the end of the journey. That incident could not easily be repeated with this coach.”—Australian Coachbuilder and Wheelwright.

AUTOMOBILE TIRES IN BRAZIL

Despite a loss of nearly \$10,000 in its sales of automobile tires to Brazil during 1914, the United States maintained its proportionate share of the year's trade, but this share is only three per cent. of the total. France, Germany, and Italy suffered severe losses during the year as compared with their trade in 1913, but Belgium and Great Britain made substantial trade advances. These facts are graphically shown in the following summary:

	1913	1914
Imported from		
United States	\$24,363	\$15,714
Belgium	57,608	79,638
France	375,662	188,247
Germany	160,740	74,131
Italy	59,187	11,416
United Kingdom	63,333	100,965
All other countries.....	5,302	6,975
Total	\$746,195	\$477,086

“MORE THAN SATISFIED”

He was deeply in love with his wife, but awfully careless about money matters. He started away on a long business trip, leaving her short of money, and promising to send her a check—which he forgot to do. The rent came due and she telegraphed: “Dead broke. Landlord insistent. Wire me money.”

Her husband answered:

“Am short myself. Will send check in a few days. A thousand kisses.”

Exasperated, his wife replied:

“Never mind money. I gave landlord one of the kisses. He was more than satisfied.”—New York Times.

ELECTRIC VEHICLES FOR NORWAY

Our Vice-Consul at Christiania, Norway, has called attention to the fact that there is a demand for electrically operated motor vehicles of all types in Norway. Being a land of great hydro-electric development, charging stations for the car batteries may be found at frequent intervals and the rates for current are low. Furthermore, the roads are fair and well adapted for electric vehicles.

PLANNING FOR CONVENTION OF ELECTRIC VEHICLE ASSOCIATION IN CLEVELAND

Cleveland will be the scene of the sixth annual convention of the Electric Vehicle Association, the convention being held on Monday and Tuesday, October 18 and 19, at the Hotel Statler, and there are excellent reasons for believing that this convention will mark an epoch in the electric vehicle industry.

The organization meeting of the convention was held in the office of Mr. Samuel Scovil, president of the Cleveland Electric Illuminating Co., in Cleveland, on July 19. Mr. John F. Gilchrist, president of the association, addressed the meeting on the general purposes of the coming convention. Mr. T. P. Cagwin, of the Chamber of Commerce, accepted the chairmanship of the publicity committee.

After a very extensive discussion, it was decided to limit the convention to two days, namely Monday and Tuesday, October 18 and 19. It is realized that a large number of societies impose heavy demands on concerns and individuals, and that a concentrated program of two days would be greatly appreciated by the large number of delegates who would like to attend the convention. Furthermore, it was decided to make the convention a real business undertaking so that the many companies could feel justified in despatching a large number of delegates. While entertainment will not be entirely dispensed with, yet it will only be employed to supplement the more serious and practical work of the convention, and it is confidently expected that this policy will find the hearty appreciation of the entire industry, and will go far to make the sixth annual convention a bright spot in the association's history.

The Convention Papers Committee, of which Mr. George H. Jones, of Commonwealth Edison Co., of Chicago, is chairman, held a meeting in the general office of the association, 29 West Thirty-ninth street, New York City, on July 21. As a result of a well attended meeting the committee was enabled to draft a tentative papers program, which includes treatment of subjects of the utmost importance to the industry. In fact, a number of papers scheduled for presentation unquestionably will be the subject of very wide publicity as they will have a marked bearing on the new successful era awaiting the electric vehicle industry. As soon as the papers tentatively agreed upon are finally approved and acceptances are received from those invited to prepare them, same will be published.

CHICAGO ELECTRIC GARAGES INTRODUCE PARKING SYSTEM

A long desired service for the users of electric vehicles in Chicago has recently been put into effect through the efforts of the Electric Vehicle Association of America. It is a system of parking waiting electrics in the shopping district of Chicago and is of an extremely practical and necessary nature representing a service not extended by any other type of car. As many cities have laws denying the privilege of cars standing stationary for any length of time at the curb in city streets, this is some times a considerable hardship if one does not have a chauffeur.

That an electric obviates the necessity of employing a chauffeur is considered one of its greatest advantages. However, women who run their own electrics have for some time realized how difficult it is to use their cars for shopping purposes in the loop. Appreciating this difficulty several garages have established under the auspices of the Electric Vehicle Association a down town parking service for their customers, enabling them to leave their cars at the electric shop of the Commonwealth Edison Co., where a licensed chauffeur drives it to the park and returns it again whenever ordered. There is no charge for this service. The car owner simply understands that by taking advantage of the service he entirely agrees that the driver is acting only in the capacity of the owner's personal agent or representative while in any way handling the car and that he assumes all responsibility for its safety.

All electric garages who are represented in the Chicago section of the Electric Vehicle Association are participants in this plan and shortly a notice will be sent to every user of an electric in Chicago and vicinity, telling about the service. In the fall a night service will be arranged for theatre patrons.

The parking system is a much needed service which, it is hoped, will be extended to other cities where the Electricity Supply Co. will follow the lead of the Commonwealth Edison Co. in its very close and practical co-operation with electric vehicle interests.

BANNER COMPANY WITHDRAWS NAME FROM VEHICLE PETITION

The Banner Buggy Co., of St. Louis, Mo., has announced the withdrawal of its name from the petition filed with the Interstate Commerce Commission asking a revision of the classification of horse-drawn vehicles. The announcement of the Banner company, signed by President Russell E. Gardner, follows:

When this company signed the petition of the vehicle manufacturers to the Interstate Commerce Commission, asking a readjustment of the minimum charges on carload shipments of vehicles, we did so with the understanding that this petition would in no manner antagonize any other interests nor would it in any way interfere with the present privilege the dealers have of mixing buggies and light vehicles with implements and other commodities. In other words, we didn't care to profit if we had to do so at the expense of others. Neither did we care to enter into any agreement whereby we would benefit the dealers on the one hand and injure them on the other.

We were thoroughly convinced, however, that the vehicle manufacturers were benefiting their customers in attempting to change the present high minimum on carload shipments, and think, if we could have accomplished what the committee started out to do, it would have been a great benefit to the dealers and would have enabled them to have purchased small carloads of vehicles and paid freight on the actual amount contained therein, instead of having to pay a high minimum for a small shipment.

However, since we have found that the matter has been so misunderstood, and since the lawyers have advised that it would be almost necessary in a successful pushing of the suit that this mixture of vehicles and implements be attacked, we have decided, and have so notified the chairman of the committee today to withdraw our name from the complaint, and inasmuch as the papers have been publishing quite a number of articles in regard to this matter, we thought it only fair to us to state our position in the press.

Of the 22 names of vehicle manufacturers attached to the petition requesting the Interstate Commerce Commission to order a revision of the vehicle classification, only ten remain and it is not unlikely that the petition will be withdrawn on account of the effect the action sought would have on the privilege of mixing implements and vehicles in carload lots.

The D. M. Sechler Implement & Carriage Co. has already announced that its name was attached to the petition without its knowledge or consent. Now comes nine other builders with a statement explaining that the possibility of the revision forbidding mixing carloads has led them to withdraw their names from the petition. They are as follows: American Carriage Co., Anchor Buggy Co., Brown Carriage Co., F. A. Ames & Co., Delker Bros. Buggy Co., Haydock Carriage Co., Luth Carriage Co., Parry Mfg. Co., and Sayers & Scovill Co.

HORSE POPULATION

France has, normally, a horse population of 3,000,000, some 600,000 of which are available for army purposes. Russia has 30,000,000 horses, and about 7,000,000 are convertible for use in warfare. The German Allies have over 8,000,000 between them, and 33 per cent. of them can be made suitable for war.

STATE MANAGEMENT OF PUBLIC ROADS: ITS DEVELOPMENT AND TREND

By J. E. Pennybacker*

Adequate transportation facilities are a vital factor in the prosperity and civilization of any country. They are essential to the development of its agriculture and manufactures, to the working of its forests and mines, and to the spread of education and enlightenment among its citizens. This necessity has been recognized by the foremost nations of every age and steps taken to meet it by improving the methods of transportation then current.

In the United States a movement for internal improvements was projected almost contemporaneously with the establishment of the Federal government. This first took the form of highway improvement through the construction of toll roads by private corporations and the building of national highways by appropriations from the national government. These appropriations for national highways were continued by Congress for a period of nearly half a century, and a total of about \$14,000,000 was thus appropriated. About 1832, however, the steam locomotive was first used in this country, and an era of railroad development followed. It was believed by many that the railroads would obviate the necessity for highway improvement, and, consequently, efforts at improving the public highways of the country were largely abandoned. During this period of activity in railroad construction many thousands of miles of railroads were built. The success attending this movement is evidenced by the fact that today we have practically 244,000 miles of railroad, costing about \$16,000,000,000, including equipment. This mileage carries annually more than 1,000,000,000 passengers and over 2,000,000,000 tons of freight. Railroad freight rates have fallen from 7 1/3 cents per ton-mile in about 1837 to 7 1/4 mills per ton-mile at the present time, or about one-tenth the original rate, and yet, even at this low rate, the annual gross receipts of the railroads amount to about \$3,000,000,000. The cost of ocean transportation has been reduced even more phenomenally than railroad transportation. It costs under normal conditions only 4 1/2 cents per bushel to carry wheat from New York to Liverpool, a distance of 3,000 miles, which would be at the rate of one-half mill per ton-mile. These rates have remained practically unchanged for a number of years, indicating that we can not hope for much further reduction in cost by these methods of transportation.

Present Cost of Public Road Transportation

It should not be assumed, however, that all of our transportation problems have been solved, nor that there can be no further saving in our cost of hauling. The public roads throughout the country, which constitute the primary means of transportation for all agricultural products, for many millions of tons of forest, mine, and manufactured products, and which for a large percentage of farmers are the only avenues of transportation leading from the point of production to the point of consumption or rail shipment, have been improved to only a slight extent. By reason of this fact, the prevailing cost of hauling over these roads is about 23 cents per ton per mile. More than 350,000,000 tons are hauled over these roads each year, and the average haul is about eight miles, from which it

can readily be seen that our annual bill for hauling over the public roads is nearly \$650,000,000. The cost per ton-mile for hauling on hard-surfaced roads should not exceed 13 cents. It is therefore evident that if our roads were adequately improved a large annual saving in the cost of hauling would result.

Reasons for State Aid to Public Roads

Under the system of local management which succeeded the toll systems and the road building activities of the Federal government, tax burdens for road purposes rested almost entirely upon farm property. Since the cities generally escaped these responsibilities and burdens, this condition was inequitable, produced inadequate revenue, and resulted in a very widespread stagnation in the building of improved roads. A further inequity resulted from the fact that traffic in its development took no account of county and township boundaries, so that frequently the traffic from one county destroyed the roads of another county, which in turn found itself unable to obtain redress. Modern traffic gave rise to new and difficult problems of construction, which the limited skill of local officials was unable to solve. Road taxes were, to a great extent, worked out by untrained, undisciplined road hands; most of the road work

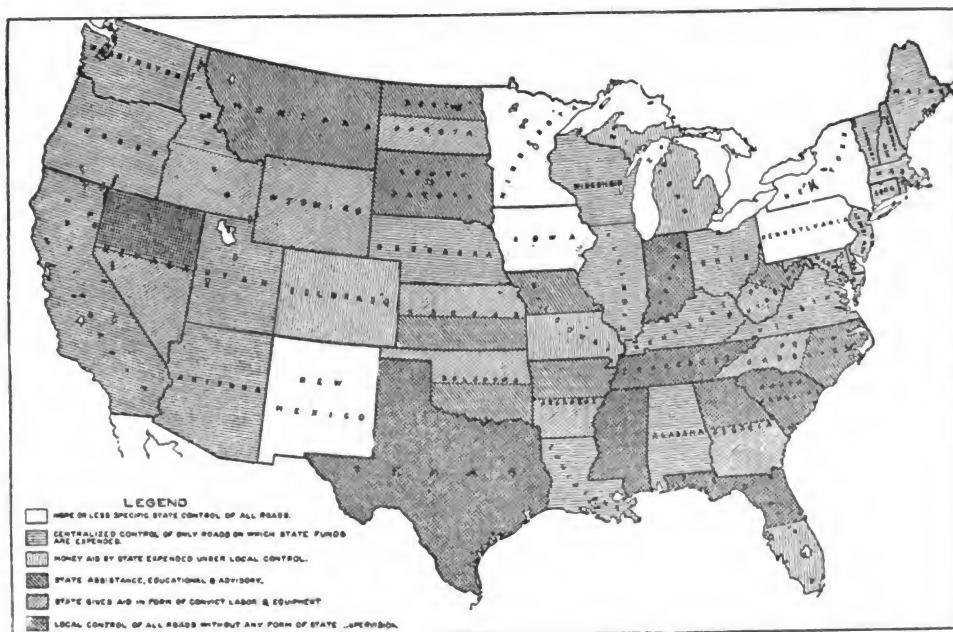


Fig. 1—Classification of state systems of road management. Construction.

consisted in patching from year to year, and little tangible progress could be shown for the money and labor expended. These conditions rendered state action ultimately imperative, and New Jersey in 1891 was the first state to take definite action through legislative enactment. The law, which became operative in 1892, provided a state appropriation of \$75,000 to aid road building in the counties, and placed the administration of the law in the state board of agriculture. In 1894 the administration of the law was placed in the hands of a state commissioner of public roads. Other states rapidly followed the precedent set by New Jersey, and this progress was greatly accelerated by the advent of the automobile. This new traffic soon became a source of revenue for road purposes through the payment of registration fees. It subjected stone-surfaced roads to exceptionally destructive wear, and thus emphasized the need for skilled management of construction and maintenance; caused a persistent demand and agitation by automobile owners for an efficient system of highways; and for these several reasons materially seconded the primary causes already cited as responsible for state action. The 1,800,000 automobiles now registered in the United States are paying more than \$12,000,000 annually in registration fees.

*Chief of Road Economics, Office of Public Roads, in Year Book, Department of Agriculture.

Progress of State Road Management

Of the progress of state road management it may be said that 42 states have thus far established highway departments for educational or administrative work, and of these 30 have made actual appropriations in aid of road construction or maintenance. In all \$208,000,000 had been appropriated from state funds between 1891 and January 1, 1915, for construction, maintenance, administration, and educational road work, and a total of about 31,000 miles of improved roads is the evidence to show that this expenditure was not in vain. These roads were built for the most part as a joint state and local undertaking, so that a large local outlay not included in the state total was involved. It is most gratifying, however, that within a period of 22 years a policy, begun on a small scale and cautiously extended, has produced a mileage of improved roads greater in extent than the entire "Routes Nationale" of France, and that in 1913 alone a total of 5,000 miles of state-aided roads were completed.

History of the State-aid Policy

The rapid and widespread acceptance of the policy of state participation in road improvement may be understood by a hasty chronological narrative. Following the action of New Jersey in 1891, similar legislation was enacted by Massachusetts

in 1907 a highway department for educational and investigative work, but the state has distributed considerable sums of money to the various counties for road purposes, from a war debt paid to the state, automobile license taxes, and corporation taxes. Georgia in 1908 provided for the granting of state convict labor to road improvement, with the actual work under local supervision. North Dakota established an educational highway department in 1909, but has made no appropriation for actual aid. Kansas and Oklahoma established state highway departments for educational purposes in 1911, and Oklahoma gave authority for the use of state convicts on public roads. In the same year Nebraska provided aid for bridges and later required that bridges costing over \$500 shall be designed and built from plans and specifications prepared by the state engineer. Legislation was also enacted providing for an advisory state highway commission. Nevada and Wyoming in 1911 made appropriations for the use of convicts in road construction under the direction of the respective state engineers. Kentucky established a highway department for educational work in 1912, and the law was amended in 1913 to provide state aid by a one-half mill tax levy. Arkansas established a highway department for educational work in 1913. At the present time only the states of Florida, Indiana, Mississippi, South Carolina, Tennessee, and Texas have no provision for any sort of state participation in road work.

Classes of State-aid Systems

The systems of road management now prevailing in the various states may be grouped in six general classes. The first class comprises those states in which the construction of all roads is more or less under state control. In the second class are comprised those states in which state control of road construction is limited to those roads on which state funds are expended. In the third class are included the states which grant aid in the form of state funds, but allow the expenditure to be made under local control. In the fourth class are those states which have established highway departments for educational and advisory work. The fifth class is composed of the states which devote the labor of state convicts to road improvement, and the sixth class comprises those states in which the control of all road construction is entirely local.

The accompanying chart (Fig. 1) graphically illustrates this classification of the states. In the matter of road maintenance, the states may be conveniently classified in four groups. In the first group are comprised those in which the control of the maintenance of all roads rests with the state. In the second class are those in which the state control of road maintenance is restricted to the roads on which state funds are expended for construction. In the third class the state requires that roads on which state funds have been expended shall be maintained, but leaves the actual maintenance to be performed under local control and with local funds. In the fourth class are included the states which make no specific provision for the maintenance of roads on which state funds have been expended. The remainder of the states are those in which maintenance is an entirely local matter and under local control. These classes are illustrated by a graphic chart (Fig. 2).

States Leading in State-aid Work

Of the states which, for magnitude of expenditures, mileage of roads constructed, and comprehensiveness of system, stand out most prominently, several have been selected for individual mention, so that the reader may obtain a more intimate knowledge of the operation of the policy of state management.

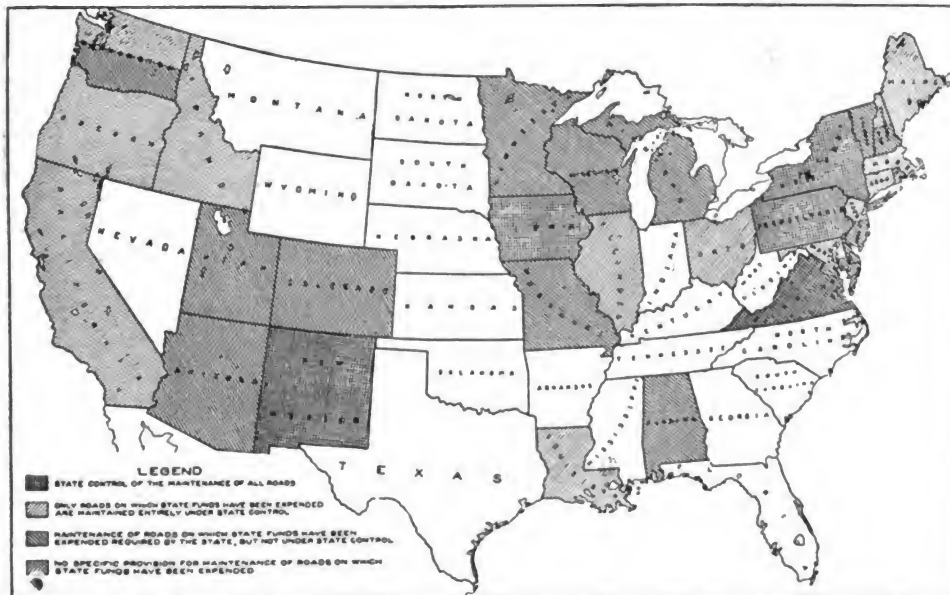


Fig. 2—Classification of state systems of road management. Maintenance.

and Vermont in 1892, Connecticut and California in 1895, Maryland and New York in 1898, Maine in 1901, Rhode Island in 1902, New Hampshire and Pennsylvania in 1903, Ohio in 1904, Idaho, Michigan, Minnesota, and Washington in 1905, Virginia in 1906, Arizona, Colorado, New Mexico, Utah, and West Virginia in 1909, Louisiana in 1910, Alabama and Wisconsin in 1911, and Oregon in 1913. North Carolina in 1901 authorized the state geological survey to conduct educational and research work as a state highway department, and has continued on this basis up to the present time, except for the authorizing of a portion of its state convict force to be used on roads under the direction of the state geological survey. Delaware in 1903 provided for state aid, but only one county out of the three utilized the aid granted. Iowa established a highway department in the state agricultural and mechanical college at Ames in 1904 for educational and research work, and in 1913 the law was very much broadened by the creation of a state highway commission having control over all road work in the state.

Illinois established a highway department in 1905, which was restricted to educational and investigative work and the distribution of crushed stone prepared by state convicts. In 1913 the Illinois law was greatly broadened and actual state aid in the form of a state road levy was granted. Missouri established

Massachusetts, which established its highway department in 1892, had expended out of state appropriations to January 1, 1914, about \$14,000,000, had completed more than 1,000 miles of state highway, and had aided in the improvement of more than 350 miles of small-town highways. The state obtains its funds for road work through the issuance of state bonds and the levying of automobile license taxes. In constructing the system of state highways the entire cost is borne in the first instance by the state, but the counties are required to pay to the state 25 per cent. of the cost. The motor vehicle fees are applied entirely to the maintenance of state highways and improvement of small-town roads.

Connecticut, which established its highway department in 1895 had expended to January 1, 1914, about \$11,500,000, a portion of which was derived from the sale of state bonds. The aid granted by the state varies according to the taxable valuation of the towns, but has been usually from three-fourths to seven-eighths of the cost of the roads on which the state has granted aid. Like Massachusetts, the Connecticut system provides for the application of automobile revenues to road maintenance.

New York established its highway department in 1898 and expended some \$25,000,000 of state funds additional to the authorization in 1906 of the first state bond issue of \$50,000,000 for road construction. A second state bond issue was authorized in 1912, amounting to \$50,000,000. This provided a total of \$100,000,000 through the issuance of bonds for the building of state and county highways. The system as laid out divides the highways into four classes, namely: State highways, to be improved and maintained solely at the expense of the state; county highways, to be improved and maintained at the joint expense of the state, county, and town; county roads, improved and maintained by the county; and town highways, improved and maintained by the town with the aid of the state. The bond issue was originally intended for the improvement of a system of county highways aggregating 8,380 miles, and to this was added a system of state highways of 3,617 miles. Approximately 4,300 miles of the state and county system were completed up to January 1, 1914, with a total outlay of state funds aggregating \$67,155,000.

Virginia has made rather remarkable progress, largely in the building of cheaper types of road than have been constructed in New York and the other eastern states. The Virginia department was established in 1906 and had expended out of state funds to January 1, 1914, a total of \$1,663,000. To show for this outlay, the state reported for the same period a total of 2,052 miles of road constructed under state supervision. Under the Virginia plan the local contribution comprises one-half of the total cost, but many of the counties accept state convict labor in lieu of money aid from the state. The law also provides that bond issues shall be expended under the direction of the state highway department. The total mileage of roads constructed under the direction of the Virginia department exceeds the total reported by any state except New York and Michigan, and as the latter state grants aid on local roads only to the extent of a small reward or bonus, the mileage reported would not be comparable on the same basis as the mileage reported by the Virginia department.

Ohio established its highway department in 1904 and constructed to January 1, 1914, a total of 578.29 miles at a total contract cost of \$4,847,768, or an average of \$8,383 per mile. Under the present law the state levies a tax of one-half mill, which provides an annual revenue of about \$3,500,000. In the expenditure of this fund the counties, townships, and abutting property owners must provide an equal amount, so that the annual outlay under the direction of the state highway department is now approximately \$7,000,000. A system of intercounty highways has been laid out connecting all of the county seats in the state, and this system is rapidly being improved and maintained under the direction of the state highway department.

Maryland is engaged in the construction of a system of state

highways about 1,285 miles in length, to be constructed and maintained entirely at the expense of the state. Bonds have been issued and authorized by the state to provide the necessary funds. The total thus issued and authorized to January 1, 1914, amounted to \$9,170,000. During 1914 additional issues were authorized, bringing the total up to something like \$15,770,000, and it is estimated that the entire system will cost approximately \$18,000,000. The total mileage of the state system completed to January 1, 1914, aggregated 490 miles. The state has been granting aid toward the improvement of roads since 1898, and the total of roads completed on which the state has paid a part or all of the cost to January 1, 1914, aggregates 1,430 miles.

New Jersey, which has the distinction of being the first state to adopt the policy of state aid, began its work in 1892 and had made a total outlay to January 1, 1914, of about \$5,800,000.

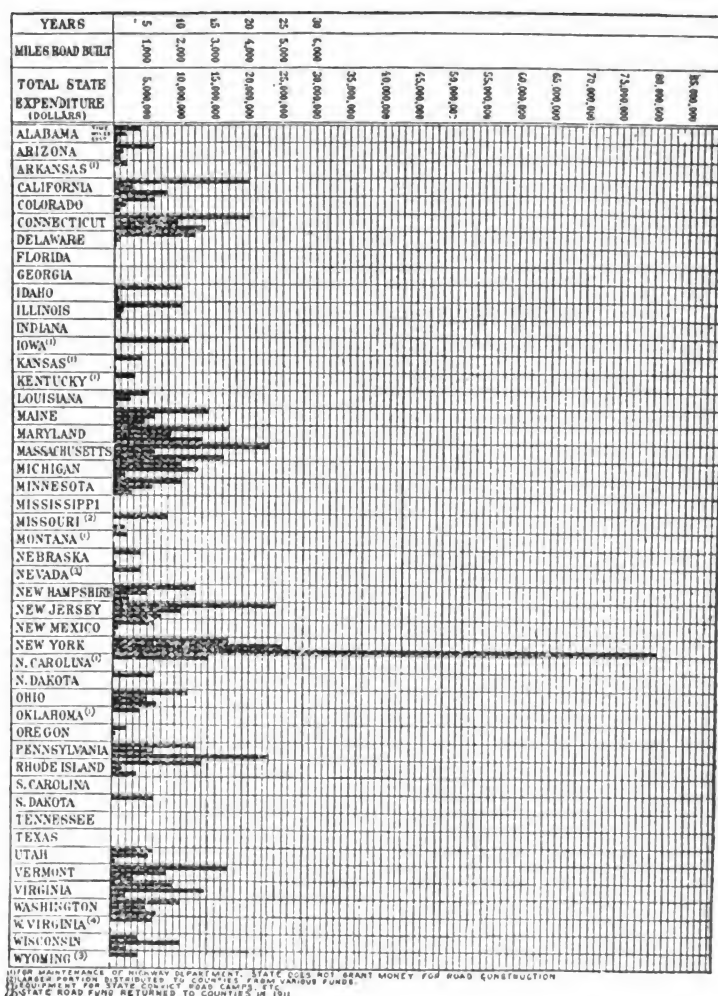


Fig. 3—Chart showing state highway progress.

The state had completed during that period 1,833 miles of road, partly paid for out of state funds and partly by county funds. The state's contribution toward the total cost aggregates about 40 per cent. Revenues derived from the registration of motor vehicles are applied to the maintenance of the roads, and recently provision has been made for the laying out of a system of state highways similar to the plan adopted in many other states.

Wisconsin, which has been operating under a state-aid plan since 1911, follows a system somewhat local in character, under which the boards of county commissioners are required to select "a county system of prospective state highways." These roads are constructed by the town, county, and state jointly, each paying one-third of the cost, or a county can assume two-thirds of the cost and the state one-third. The improvements are

made under the direction of a county highway commissioner selected by the county board, under the general direction and in accordance with plans and specifications of the state highway commission. The first appropriation made by the state was \$350,000 in 1911 and a similar amount in 1912. For 1913 the appropriation was increased to more than \$800,000, and for 1914 to \$1,230,000. Under the joint township, county and state plan more than \$4,300,000 is available for 1914. That rapid progress is being made is indicated by the fact that 996 miles of road were constructed during the year 1913, bringing the total constructed under the direction of the state highway department to 1,436 miles.

California has undertaken to construct a system of state roads comprising two trunk lines traversing the state from north to south, and a system of laterals connecting the county seats with a trunk-line system. A state bond issue, amounting to \$18,000,000, was authorized in November, 1910, and the work of constructing this state system is now well under way. State highway bonds to an aggregate of \$5,200,000 were sold to December 31, 1913, and contracts had been awarded for the construction of 356 miles of highway, estimated to cost about \$2,900,000.

State Highway Progress

A graphic chart (Fig. 3) accompanies this article showing state highway progress to January 1, 1915. It embraces the three factors of time in operation, total state expenditures, and mileage of roads completed with the aid of state funds. This chart gives a fairly intelligent conception of the progress made in various sections of the country. So wide a variation exists, however, in the traffic conditions prevailing in respective states, and in the types and dimensions of roads constructed, that a comparison based merely upon mileage and expenditure fails to convey more than a general conception of the progress accomplished. Furthermore, the outlay of state funds carries with it in the respective states widely differing proportions of local expenditure as a condition to the state outlay, and this again renders a comparison difficult. Construction costs should, therefore, be considered entirely independent of the graphic showing of progress made. The cost of a road is dependent upon not only the type of construction, but the amount and character of grading to be done, the cost of labor and materials, the width and thickness of surfacing, the character and amount of drainage required, and other factors of equal variability. Based upon general averages, however, it has been ascertained that under average conditions macadam roads can be built in southern states at from \$4,000 to \$5,000 per mile, gravel roads at from \$1,500 to \$2,500 per mile, and sand-clay and topsoil roads at from \$800 to \$1,500 per mile. In New England and the other eastern states, macadam roads are reported at from \$6,000 to \$9,000 per mile, gravel roads at from \$3,200 to \$5,000, and bituminous macadam from \$8,000 to \$13,000, according to the character of construction, whether surface-treated, penetration, or mixing method. The bituminous type is quite general in the eastern states. As indicating costs in other sections of the country, the State Highway Commissioner of Michigan reported in 1913 the average cost for macadam roads \$4,300 per mile, clay-gravel roads \$1,500 per mile, and concrete roads about \$10,000 per mile. The average cost of state highways constructed in Ohio in 1913 was \$8,383. According to types, in 1912 the brick-paved highways averaged \$14,650 per mile and the macadam highways \$5,950. In California the first 356 miles of the state system of highways cost an average of \$8,143 per mile and consisted principally of thin concrete with a thin coat of bitumen. The maximum and minimum figures given in this paragraph are not absolute, but are intended to present the usual range of costs. The rates given include grading, drainage, surfacing, and engineering costs.

Efficiency of State Road Management

The efficiency of state road management has been impaired in some of the states through the influence of politics. Changes of administration have brought about upheavals which have

proven prejudicial to the efficient and economical administration of the highways. This condition is gradually being remedied through the placing of nonpartisan commissions in charge of state highway departments, so that in the appointment of highway engineers and their assistants political considerations shall have no weight. Furthermore, competent engineers may be attracted to the work by the realization that they will not be disturbed in office so long as they render efficient service.

Maintenance

In the early stages of state road management little or no provision was made for the maintenance of roads constructed with the aid of state funds. This condition has developed into a serious problem, and many of the states are finding it difficult to obtain sufficient funds to resurface and properly maintain the large mileage of roads already constructed. It was thought at first that if the states aided in the construction of roads the counties could be depended upon properly to maintain them. This has been found to be a case of misplaced confidence, and the only way in which the states could obtain proper maintenance was to place the work under the immediate direction of a state highway department. Automobile revenues are for the most part applied to the maintenance of roads, and many of the states are providing annual cash appropriations in sufficient amounts properly to meet existing conditions.

State Control

The realization has become quite general that, in order to render maximum service, state highway departments should be given some measure of control over the construction and maintenance of local roads. For this class of roads an amount exceeding \$160,000,000 is expended annually, with comparatively little result to show in the form of improved road mileage for this great outlay. The state of Iowa has met this situation by placing all the road work in the state under the direction of the state highway department.

Traffic is increasing so rapidly as to cause excessive wear upon the roads, especially in the vicinity of congested centers of population. This results in a heavy annual maintenance cost, averaging in the large eastern states not less than \$750 per mile per annum. Many experiments have been made in the effort to devise types of road which can be maintained at relatively low cost. Thus far, aside from the cheaper forms of construction, the states are depending upon the various forms of bituminous macadam, concrete, and vitrified brick road.

Essential Features of Successful State Management

Summarized briefly, the essentials to successful state highway administration, as demonstrated by the experience of the various state highway departments, are as follows: (a) The elimination of politics as a factor in state highway work; (b) the control by the state highway department of all work on which state funds are expended; (c) adequate appropriations for continuous maintenance of highways under efficient supervision from the day the highways are completed; (d) state supervision as to surveys, plans, and specifications of roads and bridges constructed under bond issues, and supervision of such other road and bridge work as requires considerable cash outlay and the exercise of engineering skill and knowledge.

Highly desirable progress toward the attainment of efficiency in state highway management could be accomplished by a general revision of state road laws, so as to eliminate all obsolete and conflicting legislation and to reduce the really essential laws to a few simple, clear-cut statutes which would define duties and responsibilities and provide ways and means for conducting highway work. A literal compilation of the road laws of the several states has already been made. This great mass of legislation exceeds 4,000,000 words. It is difficult to imagine conditions in any state which would necessitate more than 10,000 words to deal adequately with all phases of highway improvement. If this average were maintained for the 48 states, it is evident that without any loss whatsoever in efficacy 3,500,000 words could be wiped off of our statute books.

Conclusion

State road management is a concrete manifestation of the universal demand of the age for efficiency and equity in the management of public affairs. Its advocates contend that only by state appropriations can the burdens of constructing roads of more than neighborhood importance be equitably apportioned; that only by reaching such adequate sources of revenue as are possessed by the state can sufficient funds be obtained to improve the roads commensurate with their importance; that only through the establishment of a state highway department can the best engineering and practical ability be obtained for the benefit of the entire state, as by any other plan only the wealthier counties could afford to obtain such assistance; that through this centralized management correlation of road work throughout the state may be obtained and the influence of local politics in some degree eliminated or modified; and that standardization as to methods, costs, and administration may be greatly promoted by such centralized control. It must be said as evidence of the efficiency of this system that no state is on record as having permanently abandoned the policy once it has been adopted. The whole development of state road management has been toward a larger measure of participation by the state through increased appropriations and more comprehensive state supervision.

VEHICLE LICENSE KNOCKED OUT

About 1,500 people in Hamilton, O., who have been paying a vehicle and horse tax for some time will be interested in the decision by Judge Walter S. Harlan, rendered recently in which that judge knocks out on every leg that it stood the Hamilton city vehicle ordinance, finding the ordinance unconstitutional and illegal.

In the municipal court Judge Shank has been fining drivers for operating wagons or vehicles on the streets without first paying the city an annual fee for a license. These fines Judge Harlan has knocked out by his sweeping decision, dismissing these drivers and holding that any fine assessed against them in the municipal court is illegal and is set aside by the decision.

The license of vehicles in the city of Hamilton by the mayor under a city ordinance was attacked this time by the court of Judge Harlan by several teamsters who were fined in the municipal court for not having paid a license, and by J. W. Faucett, of the J. W. Faucett Transfer & Storage Co. The Faucett case, however, has not been heard, but Judge Harlan states that the outcome of that case hinged on the cases decided, which were the appeals of the teamsters that the fine against them be set aside as the ordinance under which it was imposed was illegal and unconstitutional.

Judge Harlan based his decision on a decision of the local Court of Appeals, rendered recently, in a similar suit at Middletown.

In Middletown several automobile owners that were charged a license filed a suit and the Court of Appeals set it aside on final hearing, because under the laws of Ohio it was illegal and unconstitutional.

Judge Harlan quoted this sweeping decision and gave it as the chief reason for setting aside the vehicle ordinance in Hamilton.

Judge Harlan, quoting from the ordinance in question in Hamilton which taxed vehicles, said that it was intended that the ordinance regulated the use of the streets of Hamilton, when in fact it did no such thing, for it did not specify width of tires, loading of vehicles, how vehicles should pass each other, etc., but simply levied a tax, and the court finding that it did not regulate the streets, but levied a tax for revenue only, and for the chief reason that the Court of Appeals had knocked out a similar ordinance in Middletown, Judge Harlan dismissed the men fined for violations, set aside the fines, and held the vehicle license of the city of Hamilton illegal, void, and set it aside and out of force and effect.—Transfer and Storage.

COLLAPSIBLE ALL-STEEL RAILWAY COACHES

The Electric Railway Journal gives some interesting particulars concerning some new rolling stock built for the Erie Railroad. The structure is so designed that it will not only resist telescoping, but collapse should the coach be overturned. The whole of the side of the body from floor to roof is in effect one deep girder. There is no belt rail, since the side structure is composed of a series of T-shaped pressings, with diagonal braces at the bottom, which make up the complete supporting framework. The paneling serves only to house the interior of the car, and is made up from 1/16 in. sheets of American ingot iron, this metal being chosen in preference to steel on account of its rust-resisting qualities when rolled in thin sheets. The glass frame rests are supported directly by the side posts, being welded to them to secure waterproof joints. The argument in favor of making the whole of the side of the body into one deep girder is as follows. The side of the car is 7 ft. 5 in. high, or about two and a half times the height of girder which is possible in the type of construction where a heavy belt rail at the window sills serves as a compression member. As deflection varies with the cube of girder height, while strength varies only with the square of the height, the rigidity of the structure is more than two and a half times as great as it would have been with equal strength had the side girder been limited to the height between the window sills and side sills or bottom sides. In comparison with the underframe type of construction, where there is no side girder at all, the rigidity of these new cars is calculated to be seven times greater even with cars of equal strength. As the body structure is so rigid, special attention has to be paid to the draught and buffing gear. Illumination of the cars is carried out by means of electric fixtures in the center line of the car, and the form of the roof is such as to reflect and distribute the light evenly over the seats and gangway without producing shadows. The interior paneling is of fire-resisting Agasote throughout.

TORONTO WORK-HORSE PARADE

The Thirteenth Annual Open Air Horse Parade and Show was held in Queen's Park, Toronto, on "Dominion Day," July 1, under the patronage of their royal highnesses the Duke and Duchess of Connaught and his honor the Lieutenant Governor of Ontario. This exhibition is held annually by the Toronto Horse Parade Association to encourage the humane treatment of horses. A feature of the day was the sale by young women of small flag badges, from which was realized \$5,000 for the Toronto Humane Society.

The 800 horses in the parade were divided into 50 classes, which were all exhibited in harness, except a few saddle horses. The greater part of the exhibition was devoted to horses used in vehicles for commercial purposes, ranging all the way from the light one-horse delivery wagon to the heaviest two-horse trucks, with a few heavy three-horse teams driven abreast. There were in the parade two classes of old horses that had been in the continuous service of their exhibitors for from 10 to 22 years, and a prize was awarded to the faithful animal that had served one owner for 22 years. It was a good opportunity to see what fine horses are used for commercial purposes in Toronto. The Toronto horse parade, which is the only one of the kind held in Canada, is exceeded in size by similar parades only in Boston and London.

The Canadian Horse Show, usually held in Toronto in May, was omitted this year.

REBUILDING STENGEL LEATHER PLANT

The part of the factory of George Stengel, Inc., manufacturer of carriage, automobile and shoe leather in Weston avenue, Newark, N. J., which was burned out several months ago, will soon be rebuilt. The new structure will be three stories high, will be built of brick and will cost approximately \$40,000.

EFFORTS MAKING TO MEET SOUTH AMERICAN CREDIT DEMANDS

Whether or not the long credits that have been a feature of South American trade in the past will ever be considerably shortened so that they may meet fully the convenience of United States manufacturers is a question that will take time for an answer and appears more and more doubtful. Europe has used credit along with price in competition heretofore, and it is almost a fair proof of the real necessity of long credits in South American trade that the merchants who bought have paid the cost of the long credits without an attempt to change the system. For the long credits have increased the real price of merchandise. The German exporters, who have been credited with using credit most successfully in extending their trade, have always charged a stiff interest rate—as a matter of fact, the privilege that merchants in this country obtain from wholesalers, jobbers and manufacturers, of a certain period of credit at the end of which they pay only the net price or even take a discount (for "cash 30 days," say), is not anywhere so freely and extensively accorded in trade in South America.

The system of credit extension has really amounted to merchandising with an apparently low price for the goods sold and an additional good profit in the incidental credit extensions. On an enormous aggregate of goods sold in South America the sellers have made from one to two per cent. from "sight" on till the payment after 90 days, six months, etc., being the difference between the rates they charged South American merchants and the rates they obtained from the German banks that discounted all paper the sellers did not prefer to carry themselves.

Although there are strong South American houses that took trade discounts, the long credits have been a service that trade in general readily paid for. That there was some abuse of the situation, that merchants used the credit for speculative purposes, is true. The President of Argentina, in his message to the Argentine Congress, declares that speculative abuses of credits have been one cause of the depression from which Argentina is emerging. But there was probably more legitimate use than abuse.

At any rate, it will not be the easiest thing in the world to convince the South American business man that long credits are a bad thing for him and to persuade him to get nearer a cash basis. He knows genuine economic uses of the long credits that we have not thought of. Europe has not only financed the big, organized industrial development of railways and a few industrials in South America; it has also furnished a great fund of capital for financing of the current flow of elementary native industry through the very long credits that have been criticized. Just a hint of the South American point of view was obtained during a casual talk with a merchant of one of the Latin republics who was a delegate to the Washington Conference.

He was a substantial and obviously broad-viewed man who spoke English well. He was a manufacturer as well as trader and commission merchant. In full confidence that he recognized the sound need for a change, it was suggested to him that a beneficial outcome of present conditions would be a situation in which credits would be just long enough to permit a merchant to "turn over" his goods and get his money.

He looked puzzled. "No," he said, "we need longer credits than that. We want the use of the credit for other purposes."

And he explained how, when a merchant of Honduras buys a bill of goods and has six months to pay, he can not only sell the goods within that time, but can make a purchase of coffee in the interior with the money, transport it to a seaport, and make a sale, with the proceeds of which he settles his bills. Very likely the commission merchant at the seaport who sold him the merchandise buys his coffee also. It is a hint of how European credits have served South America's needs for liquid capital in interior trade. It is a hint of the difficulty we may have in considerable shortening of credits.

The business and banking interests of the United States are

in a position to continue this service of financing South America's interior commercial movement if the machinery that is necessary to make the extension of mercantile credits safe and easy can be quickly perfected. European commerce and banking has had a long time to gain experience. But there is a way by which we may organize at once. The Foreign Trade Department of The National City Bank of New York is inviting manufacturers and exporters who have done business in South America to co-operate in perfecting without waste of time a machinery for safe credit extension which will bring into play the facilities of the new banking system so that they may be used for credit extensions in the other countries.

The National City Bank's branches have already got under way in their work of accumulating credit information and ratings in South America. A careful record has been made also of drafts going through upon South American business houses, which enables the Credit Department to furnish the information how these houses, in the present depression, have met their current obligations. The New York office has begun to receive full, detailed reports on the leading business houses—who they are, extent of their trade and stocks, apparent enterprise, and such information about finances as is obtainable. Now the bank is asking the co-operation of United States concerns that have done business with South America for information, in confidence, from their experiences. There is a big spirit of generous desire to help in this national movement abroad, and it has given the incentive to these concerns to join in this work, even when, sometimes, they did not see that an exchange of information will be of distinct advantage to them.

With all this direct information about the credit of South American concerns available, there should be no good reason why our manufacturers should not adopt the European methods or modify them to suit, extend credits to safe buyers at interest rates they will be glad to pay, being able to discount the paper arising out of these commercial transactions on attractive terms with banks here, thus taking over, under our system of banking and mercantile credits, by means of voluntary co-operation, the combined merchandising and financial activities of Europe.—The Americas.

BRICK ROADS GROW IN FAVOR

A rapid increase in the mileage of vitrified brick roads in this country is predicted in a new bulletin (No. 246) of the United States Department of Agriculture. Such roads possess distinct advantages—durability under all traffic conditions; afford easy traction and moderately good foothold for horses; and, third, easy to maintain and keep clean. However, they are expensive to construct.

The following formula is a rough guide for the probable expense of a brick road with a six-inch concrete foundation and suitable grades: Cost per square yard, $1.90 L + 0.213 C + 0.138 S + 0.157 A + 0.040 B$.

In this formula C equals cost of cement per barrel, S equals cost of sand per cubic yard, A equals cost of coarse aggregate per cubic yard, B equals cost of paving brick per 1,000, and L equals cost of labor per hour. Thus, if labor costs 25 cents an hour, the labor cost per square yard of pavement will be 1.90 times 25 cents, or 47.50 cents. The cost of the cement per square yard will be 0.213 times the price of a barrel, and so on with the other items.

RUNNING FULL CAPACITY

That the greatest activity of months is now on at the plant of the Ashtabula (O.) Hide & Leather Co. was announced by officials of that company. The plant is running full capacity, with 200 men employed, and additional machinery is being installed. The men work full time, 60 hours a week. Most of the product of the plant goes to the automobile factories at Detroit, and other automobile manufacturing cities, where the leather is used for upholstering automobiles.

BRITISH AUTOMOBILE MANUFACTURERS ACKNOWLEDGE BENEFITS OF TARIFF TO THIS COUNTRY

A few weeks ago I pointed out how large output enables American firms, by the use of highly specialized machinery, to overcome their handicap of high wages, and to beat the European manufacturer on price every time, and I further showed how the high wages they had to pay in the States is, in itself, a factor which, by encouraging this specialization and enabling it to be commercially economical on a smaller quantity production than would be the case in Europe, actually helps the American producer toward this end. I now see that a Colonial reader rather takes me to task for defending the British manufacturer on the ground I did, and urges that, had the British manufacturer specialized and laid himself out to produce in quantity at quantity price, he would by now have had the quantity sales which are, of course, necessary to keep such an organization going. In this I fear my critic is wrong, and his criticism shows that he has not fully grasped all the factors in the situation.

Considered without reference to other considerations which affect the question, there is ground for his contention. All other things being equal, the lower the price of an article the larger will be the sale. That goes without saying. But, unfortunately for the British manufacturer, all other things in this case are not equal by any manner of means. My correspondent has forgotten that there are such things as tariffs, and that by far the largest and most receptive market in the world has, until quite recently, been closed to us by a tariff approximating 45 per cent., in addition to the natural handicap of boxing and freight charges, and that even now, although things are better, this tariff wall is still over 20 per cent. on motor goods, which is quite as formidable an obstacle as under the old rate when the local conditions which exist today behind that tariff wall are taken into consideration—conditions which themselves are the result of the protection provided by the barrier.

Had there been no tariff barrier between the two countries, British manufacturers would have been upon safe ground in laying out for quantity production, as their market would not have been restricted; but, as it was, five or six years ago, when specialization first took hold of the American motor trade, the entire motor trade of Europe and the rest of the world, bar the United States, was but a very small proportion of what it is at the present time—barring war conditions, of course—while the market in the States was already as large, or larger than the rest of the world combined, and the American producer was absolutely protected in that market. Moreover, he knew that the factor of price rules the purchaser in America very much more fully than is the case here, and he had the very fullest encouragement to go all out for standardization, concentration of effort and a price campaign, with a result with which we are all of us now familiar.

It must further be remembered that, when this campaign commenced in the United States, conditions were different here from what they are now. Very few firms indeed in this country were making any profits worth talking about in the motor trade, and public opinion in regard to cars was so varied that it would have been difficult to select any one model to work upon. I remember, about that time, interviewing a number of capitalists in regard to the manufacture of a car of considerable simplicity and moderate price, but the opinions I met with were absolutely contradictory. Those who were not motorists seemed to think nothing would be worth tackling except a very much cheaper car than was under contemplation—the £100 car, in short, which at that time was not a possibility—while those who were motorists would not look at anything so unpretentious as that which I had in hand, and the only sort of car they felt there was any future for was a 60 h.p. vehicle, which should be better—i. e., faster—than anybody else's. Had we had the markets of the world, and especially the markets

of America open to us, as well as our own, very possibly British capitalists would have plucked up sufficient courage to back a 10,000 car proposition, which, it will be remembered, Ford's was in the first place; but, while they were waiting to see somebody else make money out of motoring first, American capitalists, taking their courage in both hands, stepped in, and backed their manufacturers, and as a result their smile today is of the order that "won't come off." It is still possible, in one or two branches of automobile work, for British manufacturers, if backed by ample capital, to tackle manufacture on the basis of a "price proposition," and in doing so—now that the American tariff has been reduced—to operate for sales in the markets of the world, America included. But these openings are being rapidly closed up by American enterprise, and they do not exist today in the direction of the low-priced or moderate-powered touring car, which has been brought to such a figure in the States that even the reduced tariff wall is a full and efficient bar to our entering there. Given free trade throughout the world the British manufacturer would whip the world, says Henry Sturme, in Motor, England, but, under existing conditions, he cannot help himself. An adequate protective tariff throughout the Empire would help him to secure and retain the trade of the Empire, and that half-loaf would be better than no bread. Without it, in all competition where price is the ruling factor in securing business, he is handicapped out of it, and, as I have so often said before, he must depend upon the high quality of his goods for his market—and a high quality market is not a quantity market.

SUGGESTION CONTEST OPENED BY CHALMERS COMPANY

The Chalmers Motor Co., Detroit, Mich., has promoted a suggestion contest. It is open to every one of its employes, except officials. It will close December 24. The winner will receive \$100. There are two prizes of \$50 each, five of \$20, twenty of \$5, twenty of \$2.50 and fifty of \$1.

The intention is to have every member of the Chalmers force try and find something which will bring about or will lead to some improvement no matter in what department of the plant and no matter whether it applies to head or hand work, to shop work or office work. It may concern improvements in machinery, how to increase sales, how to reduce mailing or transportation cost, precautionary health and fire measures, advertising ideas, reduction in costs in any department, substitution of machinery for manual labor, etc.

Suggestions from heads of departments, superintendents, foremen, engineers, designers and inventors relating to other work than their own will also be considered.

SHELDON ORGANIZATION CONVENTION

An organization meeting of the sales executives and operating departments of the Sheldon Axle & Spring Co. was held at the office of the company at Wilkes-Barre, Pa., on July 14, 15 and 16, with the following members of the organization in attendance: Geo. M. Wall, general manager; J. Fred Armstrong, secretary; Chester A. Ide, treasurer; F. L. Martin, auto axle sales manager; A. M. Laycock, auto axle chief engineer; David Landau, consulting spring engineer; John B. Kaier, Richard A. Schaaf, E. B. Flanigan, engineering department; E. J. Roth, spring department; Thomas Palmer, general superintendent spring mills; F. W. Kleist, A. C. Jamison, Chicago; L. E. Lyons, H. W. Bowman, E. W. Acker, Detroit; O. A. Timberlake, W. M. Jones, Cincinnati; J. A. Young, Trenton; W. D. Gordon, Peoria; W. J. Daniels, New York City; D. F. Carmody, Wilkes-Barre; E. A. Shelly, advertising manager.

Departmental meetings of the spring, horse-drawn and auto axle departments were held in the offices of the various departments in the forenoons, at which departmental subjects only were handled.

Organization luncheons were served in the green room of

the Hotel Sterling and immediately following the cigars, the general sessions of the organization were held, at which time the plans of the management for maintaining the high quality of its product and increasing its facilities to render greater service to its customers, were explained in detail.

The various representatives reviewed the past and present trade conditions in their respective territories and forecasted the opportunities for the coming year. Every member of the organization takes part in these discussions, and in this way the individual members learn directly the trade conditions existing in every part of the country.

Much of the Sheldon success is attributed to these meetings as the advertising, manufacturing and sales departments know exactly along what lines to concentrate their activities, and today Sheldon products are used as extensively in Europe, Australia, Africa, Canada, South and Central America as they are in the United States, while the works are the largest of their kind in the world.

OPPORTUNITY TO VISIT BIG RUBBER FACTORY

The Goodyear Tire & Rubber Co., Akron, O., is anxious for the vehicle folk to visit their big plant during the C. B. N. A. convention at Cleveland, and to this end have issued the following invitation:

You are cordially invited to become the guests of The Goodyear Tire & Rubber Co., on one of the days of the C. B. N. A. convention, Cleveland, 1915.

Cleveland is 35 miles distant from Akron, by train, trolley or automobile, and Akron is the greatest rubber manufacturing city in the world. The distance is covered by train in less than one and one-half hours.

We propose to arrange for the direct transportation of your party, without change of cars or other confusion, directly from a given point in Cleveland to our plant.

We have no doubt you will encounter many things of interest in a visit of inspection of the largest tire factory in the world—and we shall take pleasure in doing all things possible to make the trip memorable. Lunch will be served in our own restaurant, and we believe you will return to Cleveland with a distinct impression of an unusual experience and a pleasant day.

May we have your acceptance early, so that we may proceed to make arrangements for a stated number of guests?

It goes without saying that the ladies as well as the gentlemen are included in this invitation.

NEW MONOGRAPH ON COMMERCIAL LAW

The Bureau of Foreign and Domestic Commerce has just issued a monograph on "Commercial Laws of England, Scotland, Germany and France" as No. 97 in its Special Agents Series.

In this publication, which is the work of Commercial Agent Archibald J. Wolfe, in collaboration with Edwin M. Borchard, law librarian of the Library of Congress, special attention has been given to the jurisdiction of the various courts, lawyers and their fees, costs, chattel mortgage, attachment, powers of attorney, bankruptcy laws, and laws relating to unfair competition and trusts. The monograph may be obtained for 15 cents from the Superintendent of Documents, Washington, D. C.

One of the most interesting chapters deals with the German law against unfair competition. This law contains some unique provisions. For example, it is not generally known in America that in Germany such expressions in advertisements as "best and cheapest place to buy," "sold at factory prices," etc., are inadmissible unless true; that actions have been sustained against merchants who displayed signs of "English spoken here" when the assertion was not in accordance with fact; that it is unlawful to attempt to entice away prospective customers standing in front of a competitor's windows; and that a tailor

may be enjoined from describing his establishment as "first class" when he pays his workers according to the fourth class in the scale of wages of the local tailors' guild.

MULE NOT A HORSE

The ethnical aspirations of the Minnesota mule have been thrown down and stepped on by the Supreme Court of the state, which in a case of nation-wide interest denied that the humble, long-eared, hard-working animal has the qualities and graces that entitled him to recognition as a regular horse.

Attorney-General Lyndon A. Smith has won a great victory over one-time Senator John Moonan, of Owatonna. Bernard Fischer and C. J. Ost, of Steele county, who captured George Thomas Greer after Greer on February 8 last stole a pair of mules and made off with them, will not get the \$200 reward that is the standing offer of the state for catching a horse thief.

In vain the big books from Webster's Dictionary down were quoted and in vain the claimants cited cases in Tennessee, Missouri, New York, Ohio and other states to prove their ground. No one denied that Fischer and Ost caught Greer or that Greer was convicted. But Greer stole mules, not horses, the Attorney-General set forth. "Can a mule ever rise to the dignity of a horse?" he asked.

"Greer stole two mules," they said. "A mule is 50 per cent. horse. Therefore, necessarily, Greer stole one horse." And they cited voluminous authority, arithmetical and physiological. But the Supreme Court could not see it.

"A mule is not a horse within the meaning of G. S. 1913, section 5195, giving a reward for the arrest and conviction of any person charged with horse stealing.—Bunn, J." That is the text of the decision that puts a quietus on the zoological status of the Minnesota mule.

COMMERCIAL ORGANIZATIONS IN FRANCE

French chambers of commerce differ in many essential respects from similar organizations in the United States. They are public bodies, controlled by legal enactment, possessing administrative powers, and working in co-operation with the authorities of the government. The activities in France that parallel those of American chambers of commerce are to be found in manufacturers' associations and employers' syndicates.

The French government correlates and coordinates every feature that can be made to act upon the commercial development of the nation. A most effective system of commercial direction and regulation, trade promotion, and industrial education is maintained by the Ministry of Commerce and Industry.

A monograph covering this subject in detail has been issued by the Bureau of Foreign and Domestic Commerce as No. 98 in the Special Agents Series. It is entitled "Commercial Organizations in France," and may be obtained for 10 cents from the Superintendent of Documents, Washington, D. C. It contains a history of the French organizations, a survey of their rights and functions, the distinguishing features of the various bodies, lists of all chambers of commerce in France, regulations governing them, an account of their participation in legislation and judicial work, and a description of all the commercial institutions of the government.

HORSES

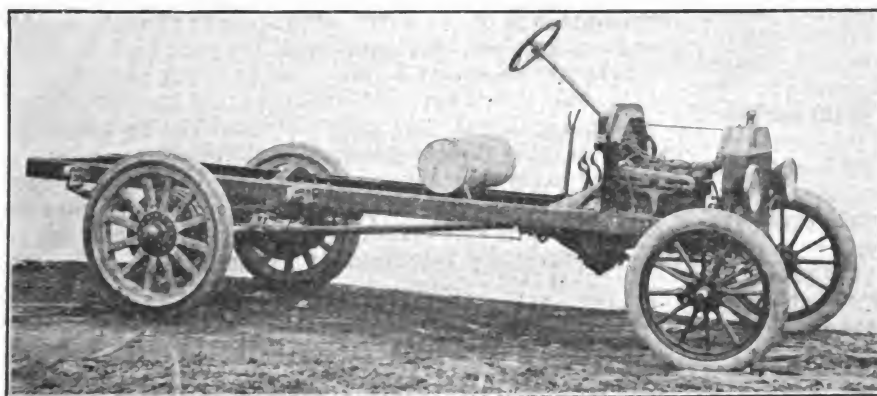
The United States army officer who sounds a note of alarm over the exportation of horses and mules must belong to the cavalry. In one year we have shipped to Europe 249,257 horses and 52,872 mules. It is his opinion that if we want to prepare for defense, the outgo of these useful animals should be stopped at once. Yet the Bureau of Statistics recently reported that in 1914 we had 20,962,000 horses and 4,449,000 mules. Unless the demand increases very rapidly, the war will have to last a long time to make serious inroads upon a supply starting from such a basis.

THE HUDFORD UNIT FOR FORD CARS

Conversion of the pleasure car chassis for service purposes is not generally a success from either a practical or economic viewpoint, from the fact that the rear springs and rear axle and wheels are not designed to carry heavy loads, even if the frame has sufficient strength, and while the power plant may be in every way adequate and enduring, the construction of the chassis is not what could be expected to withstand the work that a service vehicle must do to be profitable.

The comparatively small cost of the Ford chassis and its economic qualities generally have impelled many people to convert them into service wagons, which is usually done by installing a body that will have sufficient space to carry a freight of considerable bulk. With such equipment, however, the almost universal result is overloading and quick deterioration must follow, because the speed is not reduced.

With any Ford chassis the safe load is not much in excess of 600 pounds, and with such a freight the highest speed ought not to be more than 20 miles an hour, but the engine is not



governed and without material reduction of the rear axle differential gearing, which cannot be accomplished save by considerable expense and practically reconstructing the axle, the drivers will drive faster than good judgment should dictate.

The Hudford Co., Philadelphia, Pa., is manufacturing a unit with which a Ford chassis may be converted so that it will carry 2,000 pounds of freight, and the speed is so much reduced that a safe limit cannot be exceeded. This unit consists of a frame, springs, internal gear drive rear axle and wheels and a main driving shaft, which may be used in combination with the power plant, frame, front spring and axle and wheels. The machine when assembled has regular Ford wheels with pneumatic tire equipment forward, and substantial truck wheels with solid tires for the rear wheels. The unit is so proportioned that no greater load is carried on the front axle than when a Ford chassis is used for passenger service, and for this reason no change is made in the original construction. As the greater part of the freight is borne by the rear axle, this is not only changed to a dead type that will endure greater stresses than will probably ever be placed on it, but the design is such that with this strength it is extremely light.

The frame of a Ford chassis is 100 inches in length, and the main frame of the Hudford unit is 156 inches. The Ford wheelbase is 100 inches and when the Ford and the Hudford units are assembled the wheelbase is 120 inches, with a considerable over hand that will substantially support any body that is placed upon it, and when the load is 2,000 pounds approximately 90 per cent. will be carried by the rear axle. This frame is installed surrounding the Ford frame, the two being secured by strong cross members, the Ford frame becoming practically a sub-frame, in which is suspended the power plant.

The rear springs are semi-elliptic and the frame is suspended between them, the springs being pivoted at the front ends and shackled at the rear ends. The traction and torque stresses are through the front ends of the springs, there being no radius

rods. The internal gear driven rear axle consists of a solid load-carrying member on which is mounted a jackshaft that has the usual bevel gear and differential gearset assembly, the ends of the jackshaft carrying spur pinions that mesh with internal ring gears that are mounted inside the drums attached to the rear wheels.

The jackshaft is enclosed by a housing, the outboard ends of which are supported by the spiders that cover the internal gearing and which carry the anchor studs and the camshafts of the internal expanding brakes. The differential reduction is very small, but the reduction of the internal gearing may be either 7:1 or +6:1, the former ratio being standard and the latter optional if the owner desires a faster vehicle. The wheels are equipped regularly with solid band tires, but pneumatic shoes are generally installed when the higher speed ratio is specified. The rear wheel brake is ample for all purposes, the drums being large and wide faced, and are connected through the usual linkage with the hand lever. The brake is ample to lock the wheels with practically any load placed on the machine.

The driving shaft of the Ford chassis is replaced by a larger tubular shaft with a slip joint at the rear end, so that there is no end thrust upon the shaft, and the size of the shaft prevents whipping. The original control of the power plant is retained and this affords a maximum speed of from 15 to 18 miles an hour when direct driven, and the large reduction in the low ratio of the planetary gearset is such that the truck will have ample power for any work for which it could be used with a maximum load.

The disassembling of the Ford chassis for assembly with the Hudford unit requires but a few hours. The Ford rear tire equipment is 30 x 3½ inch pneumatic tires, and the rear wheels with the larger tires are installed on the forward axle so as to have the benefit of the largest shoes. The unit is constructed to patents and it is sold for \$325. With this unit, says Motor Truck, the owner of the Ford chassis can convert it to truck use, and dealers can make conversion of new chassis and sell them for comparatively small prices, there being trade discounts from the list price of the unit. When chassis are converted the complete Ford rear axle, rear spring, driving shaft, front wheels and tires are available for repairs or replacements in standard Ford chassis. The body equipment is whatever the owner may desire.

MUST ABANDON CREDIT SYSTEM TO GET TRADE IN SOUTH AMERICA

Until the American manufacturer is willing to forget the credit system and take a chance on his pay, American made goods will not find a ready market in South America.

This is the opinion of Peter Steenstrup, who recently returned from an eight months' trip to Central America, the West Indies and South America in the interests of the Hupp Motor Car Co. Mr. Steenstrup last fall told Detroit manufacturers trade with South America would not prove a "gold mine" because of the war in Europe and he has returned from another trip below the equator convinced that the war has served to make it harder to establish commercial relations with the Latin-American countries.

"The war destroyed three things most necessary for the South American trade," said Mr. Steenstrup. "It took away the credit of the countries, the ships for bringing them goods, and deprived them of a chance to get products at the terms necessary for their business. Manufacturers in this country attempt to do business with the Spanish merchants on the same basis as they do with local dealers whose credit is established. Where the manufacturer demands gilt-edge security before he will ship an order, the Spanish merchant expects from three to nine

months' credit. He is forced to sell the goods before he can pay for them.

"There is no Bradstreet or Dun in South America outside of one or two big cities. Such business cannot exist because the merchant considers inquiry as to his credit as an insult. The Spanish are honest, but they demand that they do business in their own way.

"Study of the conditions of the people and country made the German and English successful in South America. The United States has the same chance, but she must start 20 years back and attack the problem in the same way. The English even now are selling goods in South America and are making a play for the business from the countries.

"It takes a salesman of tact and patience to do business in those countries. He must be willing to await the pleasure of the merchant and he must sell him what he wants to buy, not what the salesman thinks he ought to purchase.

"When the wave of 'sell to South America' swept the country last fall, a good many merchants imagined they could dispose of products with ease. This cannot be done, because what we call necessities up here are luxuries in the tropics.

"The retarded civilization of the countries eliminates a large number of products that have a steady demand in this country. Cotton goods is the most universally required article in South America, and England seems able to negotiate that trade.

"Another reason that retards trade at this time is the fluctuation of the currency of the countries. In some of them the exchange rate for United States money is getting higher all the time. Merchants hesitate to buy on that account, fearing that by the time that they pay for the goods their currency will have dropped lower in is relation to our money.

"What the United States exporter needs is an understanding of conditions. He needs salesmen who know the country, and above all he needs the grit to tide him over a period of loss before he can build up a paying trade."

CHANGING LINCOLN HIGHWAY ROUTE

The Lincoln national highway is to be changed so as to include Washington and Baltimore. President Joy, of the Lincoln Highway Association, after having turned a deaf ear to appeals made more than a year ago by citizens of Washington and Baltimore, by a congressional delegation, and lastly by President Wilson to vary the course of the highway so that it might touch the national capital, has notified Robert N. Harper, chairman of the committee selected last year by the District commissioners that he has found it possible to change the original plans and place both cities on the route.

Colonel Harper already has advised the commissioners of Joy's decision and the work of marking the city streets which will constitute the portion of the highway running through the District and obtaining the improvements necessary in Maryland will be taken up immediately. The highway will enter the District by way of Maryland avenue, northeast, swing through Potomac Park past the Lincoln memorial, and then proceed westward by way of the Rockville Pike to Gettysburg.

VEHICLE FATALITIES

According to figures compiled from the report of the National Highways Protective Society, the fatalities due to automobiles in New York state, including New York City, for the first six months of the present year, increased from 183 for the corresponding period of the year 1914, to 241. In New Jersey during the same months automobiles killed 88 persons, as compared with 48 in the first six months of 1914.

In New York state, outside the city, during the last month 36 persons were killed by automobiles, seven by trolley and three by wagons.

In New Jersey during the same period 40 persons were killed by automobiles, four by trolleys and three by wagons. This

is the greatest number of automobile fatalities in any one month in that state.

In New York City more arrests have been made for speeding than ever before. There have been about 4,000 this year, but the offenders seem content to pay the fine imposed and do not hesitate to repeat the offense with impunity, though the magistrates are imposing minimum fines of \$25 for the most part. It would help to reduce the evil if maximum imprisonment were substituted for minimum fines.

ORDINANCE REGULATES SIZE OF CHICAGO TRUCKS

A very rational code for the regulation of motor trucks and tractors has been submitted to the Chicago city council, governing the size, weight and speed of motor trucks. It permits tractors and trailers up to a total length of 40 feet and a width of 8 feet 6 inches to move at the rate of 9 miles per hour at all times. Trains up to 100 feet in length may be operated on special permits during the night hours.

No vehicle is permitted to have a weight of more than 1,000 pounds per inch of tire width, 24,000 pounds per axle or 30,000 pounds total weight. All motor vehicles must have rubber tires.

Trucks are permitted 8 feet 6 inches width and 40 feet in length. When they have defective tires they are not permitted a greater speed than four miles per hour, and no cleats, projections or other devices calculated to injure the pavements are permitted except tire chains and non-skid devices when necessary. Trucks may not have loads projecting more than four feet beyond their rear except under special provisions and permit. Towlines may not exceed 16 feet in length.

LETTERS, PROPERLY STAMPED, MAY BE ATTACHED TO PARCEL MAIL

The New York Journal and Commercial Bulletin publishes the following item of interest:

Postmaster Morgan invites attention to the fact that it is permissible to attach a communication enclosed in an envelope having postage prepaid thereon at the first class rate to the outside of a parcel of fourth class matter properly prepaid at the rate applicable to the parcels. Letters and parcels mailed together in this manner reach the addressee at the same time. This is often necessary or desirable and a great convenience, and serves to prevent misunderstandings, avoids confusion and facilitates the transaction of business.

The envelope containing the communication should be tied to or otherwise securely attached to the outside of the parcel in such manner as to prevent its separation therefrom, and not to interfere with the address on the parcel. The addresses on the envelope and on the parcel must correspond.

LIGHT PISTON

A light piston for internal combustion engines in general and especially for use in automobile engines has been brought out by the Walker M. Levett Co., Tenth avenue and Thirty-sixth street, New York City. The pistons are made from magnalite, which is especially adapted magnalium steel. Three of these new pistons weigh approximately the same as one of cast iron of similar design and proportions, and other advantages claimed for the metal are high thermal conductivity with a cooler running engine and a lighter inertia load.

A WISE PROPHET

The ancient Hebrew prophet never saw an automobile, so far as we know, but, if he had, could he in much more accurate language have described it than when he said: "The chariots shall rage in the streets, they shall jostle one against another on the broad ways; they shall seem like torches, they shall run like the lightnings."—Dumb Animals.

THE PACKARD SERVICE POLICY

Alvan Macauley, vice-president and general manager of the Packard Motor Car Co., gives some interesting information in his paper concerning the company's service policy, as to what the maker should furnish the truck or pleasure car owner in the way of service, and why. The paper was read at the meeting of service managers in Detroit, June 29, at which time 57 different makers of both pleasure cars and trucks were represented. It was generally agreed that the truck and pleasure car service policy could not be made the same. The aim of the convention was to evolve a satisfactory policy for both lines; a policy that would be equally fair and liberal to the maker, dealer and purchaser. Mr. Macauley's paper follows:

Every motor car manufacturer, before marketing his first car, has to decide, and does decide, just what standard of excellence of product he will offer to the public. And he announces his policy through his advertising, etc., and, therefore, there is a very strong moral obligation upon him to deliver his vehicles—cars or trucks—fully up to his established standard of excellence.

If for any reason, one or more of his vehicles prove, in use, to be below that standard, then he should supply new parts and the labor necessary to bring that vehicle, or vehicles, up to his standard. This repair work should be and almost invariably is, done gratis, under the terms of the warranty adopted generally by members of the N. A. C. C. This kind of repair work we may call warranty work. I don't know how it is generally denominated among the rest of you. In any event, it is repair work which the manufacturer does gratis, willingly, because of the moral obligation that is upon him. To this extent, service policy for cars and commercial vehicles should be identical.

Beyond this point of moral obligation I can find few reasons why service policies for the two types of vehicles should be identical, but I can find a number of reasons why they may well be different.

Of course, a great many manufacturers and dealers carry their gratis repair work far beyond the terms of the warranty. In fact, most of us do, even when the repair work has been necessary by ordinary use or abuse. Now, it is not within my subject to discuss the wisdom or unwisdom of charging for repairs beyond the line of moral obligation to which I have referred. I wish merely to establish the fact that it would be perfectly right to charge for such work if the manufacturer or dealer saw fit to do so. Therefore, such work, if done gratis, must be considered as good will advertising; and we can do as much of it to trucks, or as little of it to cars, as we think advisable. If we think it pays us to do more for our trucks than we are willing to do for our cars, there can be no claim against us of unfairness, in either direction.

But there are, it seems to me, even more obvious reasons why our service policies, as affecting cars on the one hand, or trucks on the other, can be different.

Speaking of our own business: The Packard company's policies are based upon the fact that each of our dealers is equipped with a shop at which he has all the facilities for repair work. If the owner will avail himself of the facilities of our dealers, in the way most economical to the dealers—that is, by bringing his vehicles to the dealer's repair shop, then the owner will get his repair work done at a minimum of expense. But if the owner insists upon having his repair work done in a manner that is not economical to the dealer, then the owner has to pay for the luxury.

I won't attempt to differentiate between the terms of our car and truck service policies. They are considered in a paper I was asked to read recently. I will confine myself, instead, to saying that we made them different because, after trying faithfully to make them the same, we found conditions and requirements so different that we reluctantly gave up the effort, briefly, for the following reasons:

Truck drivers ordinarily do not have time during business

hours to work on their trucks. They are engaged, from the opening hour of business to its close, in delivering merchandise. The chauffeur, or driver of a car, on the other hand, usually has several intervals during the day when his car is not in service, and is, therefore, available for adjustment or repairs. For this reason, we feel that we should do more for the truck and its driver, because he has less opportunity to do for himself.

Again, the truck is a relatively slow moving vehicle. It's no hardship, and it takes very little time, for a chauffeur or owner to drive his car 5, 10, 15, or even more miles to the dealer's place of business. Whereas, to cover the same journey in a truck requires a much longer time—so long a time, usually, that the owner simply cannot afford to take his truck out of his delivery service, except, of course, in the relatively few cases in which the owner maintains a spare truck.

These reasons are the principal ones that led us to a separate service policy for trucks, though there are others of lesser importance. For instance, the fact that trucks are less under the personal observation of their owners than cars, which makes monthly inspection and monthly reports to owners very desirable. Also, trucks are usually operated by less competent and responsible drivers. They run on solid tires instead of pneumatics, and have to go where business is, regardless of the nature of the paving.

Both our service policies are based upon the theory that it is our function not to assume the responsibility for keeping vehicles in first class condition, but only to assist owners and drivers to that end. They must do their respective parts.

CHAS. M. PETERS AT HOME AGAIN

After a trip of several months' duration, including visits to most of the places worth seeing in the United States and its possessions, Mr. Chas. M. Peters, of the Peters & Herron Dash Co., Columbus, O., has returned home again. He left Columbus for New Orleans on February 14, and his "ramble" from there, after attending the Mardi Gras, extended to Havana and Panama; a 15 days' trip which landed him again in New Orleans.

After visiting Galveston, Houston, San Antonio and El Paso, and making a short call at Juarez, Mexico, he traveled to Los Angeles, San Diego, Santa Barbara and San Francisco. From San Francisco a trip to Honolulu for a month was the next diversion. After his return to Frisco he visited Yosemite Park, where he spent considerable time among the big trees, and at Mirror Lake. The big trees of Yosemite Park are named for the states in the union.

A visit was also made to Lake Tahoe, a beauty spot of the world, surrounded by snow covered mountains. From Lake Tahoe he went to Denver, visiting for a week or so with his daughter.

FURTHER LARGE ORDERS FOR TRUCKS REPORTED UNLIKELY

It is now believed that both France and England have on hand an adequate supply of motor cars, transports, etc., and that no further orders of large size will be placed for American trucks.

With the armies at a standstill in the trenches the destruction of trucks has not been great in recent months and production of the European factories, with the large purchases of trucks in America, is nearly equal to the demand. In case the line breaks and there is fast movement either way, it is likely that many trucks will be destroyed, in which event more American orders may be placed. Russia is not so well supplied, however, and will probably continue buying heavily for some time. The French army is said to have all the tires it can use. The standing order to French factories to produce as many tires as can be turned out has been modified and now tires are produced only on definite orders as to quantity.

NATIONAL FORESTS TAKE IN \$2,500,000

The National Forests turned into the U. S. Treasury during the fiscal year ended June 30, 1915, nearly \$2,500,000, an increase of more than \$40,000 over the receipts of the previous year, according to a statement just issued by the Forest Service. The timber sales, which amounted to \$1,164,000, yielded on account of the depressed condition of the lumber industry about \$70,000 less than those of the previous fiscal year, but the gain was made possible by larger revenues from other sources. The grazing receipts, which totaled \$1,125,000, increased \$127,000 over last year, and the water power receipts, which amounted to not quite \$90,000, showed an increase of nearly \$42,000.

The demoralization of the turpentine industry on account of the war's curtailment of the naval stores market caused the receipts from the sale of turpentine privileges on the National Forests to drop to about \$9,000, as against nearly \$15,000 last year. The sale of special use permits, under which all sorts of enterprises, from apiaries to whaling stations, are operated on the forests, yielded nearly \$78,000, an increase of \$9,000 over last year. There was a decrease of nearly \$37,000 in the revenue derived by the settlement of trespass cases in which government timber had been cut without intent to defraud, the revenue from this source being only a little more than \$3,000. More than \$7,000, however, was collected from other timber trespass cases. Grazing trespass cases yielded nearly \$6,000, an increase of about \$1,000; occupancy trespass cases, which occurred in only one of the seven forest districts, turned in something less than \$250; about \$60 was derived from turpentine trespass cases, and \$660 from fire trespass cases, the latter being more than \$7,000 less than the amount collected in the previous fiscal year for damage to government property through fires carelessly or wilfully started in or near national forests.

PROGRESS OF ROAD EXPERIMENTS

A report of the progress made in various experiments in dust prevention and road preservation during 1914 has just been issued by the U. S. Department of Agriculture as Bulletin No. 257. This bulletin contains reports of experiments at Lemon City and West Palm Beach, Florida, in which local coralline rock has been utilized with satisfaction in conjunction with a bituminous binder. In addition to this, inspection reports are given covering the maintenance and repairs on the test roads at Chevy Chase, Maryland and on the nine miles of bituminous surface on the Rockville pike. Reports of inspection are also given on the bituminous macadam construction which was carried out at Jamaica, N. Y., in 1911. There are also reports of recent inspections on work previously carried out at Ridgewood, N. J.; Boise, Idaho; Ames, Ia.; Knoxville, Tenn.; Youngstown, O.; Newton, Mass.; Garden City, Dodge City, Bucklin and Ford, Kas.; and Bowling Green, Ky.

No definite conclusions are offered other than those which can be drawn from the above reports of inspections.

THE TESTING OF RUBBER GOODS

The Bureau of Standards, Department of Commerce, is about to issue the third edition of a circular on the testing of rubber goods. This publication, which has been very much enlarged, is fully illustrated, and describes in detail the method of procedure in conducting physical and chemical tests of rubber. The testing machines and apparatus developed at the Bureau of Standards greatly facilitate the testing of rubber, and the object of this circular is to assist manufacturers and consumers in establishing standard specifications and standard methods of test. The subject matter proper is introduced by a brief outline of the processes through which rubber passes before reaching the factory, followed by a short description of the usual processes of manufacture, which include washing, drying, compounding, "making up" various articles and vulcanizing. The physical tests most commonly employed are explained very

thoroughly. These include tests for tensile strength, ultimate elongation, and elasticity. Conditions affecting the results of tests are discussed at some length and experimental data are given to show the necessity of a standard procedure in testing.

A general discussion of the chemistry of rubber is followed by a brief explanation of the object of each of the analytical determinations that are commonly made. After this there are given in detail the methods in use at the Bureau for each of these determinations. They are not entirely original, but have been compiled from the various publications on rubber analysis, from the information gained through the routine testing of rubber goods for delivery on government contracts, and from co-operative research with various scientific organizations.

A bibliography listing the more important books and journals devoted to rubber and the Bureau's regulations regarding the testing of rubber goods conclude the circular.

Copies of the publication, Circular No. 38, may be obtained upon application to the Bureau of Standards, Washington, D.C.

TIMKEN-DETROIT AXLE CO. OFFICIAL PROMOTIONS

Promotions and changes have taken place at the Timken-Detroit Axle Co. recently, among the officers. Former Vice-president H. H. Timken has been appointed chairman of the board; W. R. Timken remains president of the company; A. R. Demory, production manager; H. V. Alden, chief engineer, and Eugene Lewis, formerly secretary-treasurer, are appointed vice-presidents, and Mr. Lewis is also made general manager. Assistant Treasurer C. W. Dickerson is now treasurer; F. C. Gilbert, who was assistant secretary and sales manager, is promoted to be secretary and retains his other title; W. H. H. Hutton, Jr., who was purchasing agent, director of purchasing.

E. B. Lausier, who represented the Timken-Detroit Axle Co. in the east has resigned, and George L. Bitting, who formerly traveled the central states, has taken his place. He has his headquarters in Buffalo and covers the territory including Cleveland, New York and eastern Canada.

P. W. Hood, with headquarters in Chicago and Detroit, continues to represent the Timken-Detroit Axle Co. and the Timken Roller Bearing Co. in the west, but in addition he will represent the Timken-Detroit Axle Co. in southern Michigan.

Harry J. Porter, Detroit, formerly representing both Timken companies in southern Michigan, now represents the Timken Roller Bearing Co. in that territory, Ohio, Indiana and the south.

C. E. Gordon, Indianapolis, formerly representing the two Timken concerns in the central west, now represents the Timken-Detroit Axle Co. only, with headquarters in Toledo, O.

LONDON 'BUSES USE AMERICAN CHASSIS

The Great Western Railway recently purchased 30 American trucks, which are now in operation in London, Eng. A year or more ago this would not have seemed possible, as London regulations for 'buses are the strictest known, especially as regards noise.

The American trucks are of the internal gear type, which is much favored in Europe, and have passed the tests provided by Scotland Yard to assure quietness of operation. Side chain drives are prohibited because of noise. The English manufacturers have developed a type of shaft drive to meet the conditions, and it may be that the introduction of the American internal gear driven trucks will affect them, though to what extent it would be impossible to state at present.

ANOTHER NEW TRAILER

A new trailer for automobiles is being manufactured by J. F. Laura, Coldwater, Mich., who has secured a patent for a connector used to join the trailer to the automobile. The trailer is made to carry a load of 1,000 pounds.

Paint Shop

POINTS ON VARNISH

Proper light and ventilation are absolutely necessary to facilitate drying and hardening. Varnish applied in buildings that are damp and not properly heated in cold weather, will be considerably retarded in drying and hardening. Extremely hot weather will also keep varnish soft for quite a time. The best results are obtained at a temperature of 70 to 75 degrees Fahr.

Turning white is caused by the action of water and dampness. The more elastic the varnish, the better it will resist this action, whereas, cheap, brittle, quick-drying varnishes are very easily affected.

Brittleness is an inherent defect in the varnish caused by the excess of dryer, lack of oil, or by adulterated materials having been used in its manufacture. If a varnish powders white under friction of the finger or easily scratches white, that is incontrovertible evidence of its poor quality. Brittle varnishes should not be used even for the undercoats, as they destroy the toughness and durability of the finish, despite its being protected with an elastic, durable finishing varnish. It is poor economy, in any event, to use brittle varnish, as the cost of application, which is the main expense is the same as if good material was employed.

Chilling, as its name implies, is caused by exposure to cold weather. Varnish should never be used while in this condition. The remedy is to keep the chilled varnish in a warm room until it has been restored to its normal condition. Long exposure to cold weather may also cause the varnish to become "specky" and "seedy," in which event it is necessary to keep it near a steam pipe or stove for some time, until the chilled particles have disappeared.

Cracking is caused by the undercoats not having been dry when the finishing coat was applied, or when abnormally heavy coats have been used, especially for the undercoats. Brittle varnishes are liable to crack when exposed to sudden changes of temperature.

Blooming or going foggy is caused by exposure to dampness, moisture or gases after the varnish has become hard. The more elastic the varnish, the less liable it is to "bloom" or become "foggy."

Wrinkling, crawling, cramping or sagging is caused by applying the varnish too heavily or by exposure to sudden changes of temperature while in the process of drying, or if the undercoats are not dry when the finishing coat is applied.

Deadening or sinking away is caused by the undercoats not having been allowed sufficient time to dry, causing the finishing coat to become absorbed while in the course of hardening. Insufficient foundation coats will also cause the finishing to sink away.

Blistering is caused by the action of heat, especially from the concentrated rays of the sun, if sap or dampness is retained in the wood, or if moisture exists in the undercoats when the finishing coat is applied.

Pitting is caused by applying varnish over an oil or damp surface, also, if the varnisher is not careful to thoroughly incorporate the turpentine in reducing the varnish, or uses improper thinning material.

Thinning, when found necessary, should be done with spirits of turpentine. In order to insure proper amalgamation, neither the varnish nor the turpentine should be too cold when mixing. The warmer the varnish and turpentine, the quicker the amalgamation. After reducing the varnish, allow it to stand awhile before using. Oil, japan or liquid dryer should never be added to varnish.

Sweating is caused by rubbing the undercoat before it is thoroughly dry.

Almost everyone knows that varnish is made from a fossil resin (not rosin), linseed oil and turpentine. Adulterants are rosin and naphtha. Rosin is very cheap and impairs materially the durability of the varnish of which it is a part; naphtha has no perceptible effect on durability, but merely affects the working properties of the varnish, and its covering capacity. Of late years a new oil has entered into varnish making. It is obtained by pressing a certain nut found in China and it is known as China wood oil. This oil has many remarkable properties and many "deviltries," which are partly chargeable to the propensity of the Chinaman to adulterate it, and the difficulty of getting pure oil or detecting the adulteration.—Chicago Handbook for Architects.

HOW TO USE OR MIX THE YELLOWS

All yellows from the most delicate to the most powerful shade, should be laid over either a blank white or a very light gray ground, says McHillick, in American Blacksmith. Apply a white or light gray priming coat, preferably the former, then a couple of white preparation coats, these containing a good raw linseed oil binder. If the yellow is to go over a rough stuff foundation, apply the white mixed to carry one part raw linseed oil and six parts turpentine. Use, if available, a white ground in japan and reduce it sufficiently to permit application with a camel's hair brush. A second coat of the white containing one part of oil and nine parts of turpentine will produce, with a good grade of material, a dense, solid base.

Now apply a coat of the selected yellow using it, if possible, japan ground. If so ground, thin to the proper working consistency with turpentine and to every 12 parts turpentine add one part raw linseed oil. Use no oil in any of the following coats. Oil injures the color effect of the yellow and causes it to darken and discolor.

Use one coat of the flat yellow. Next break some of the yellow up in turpentine to a cream-like consistency, and to every full pint of rubbing varnish add four ounces of yellow. This will suffice for a medium price job. For strictly high grade work another coat of the yellow varnish color may be employed. To mix this coat add two ounces of color into a pint of rubbing varnish and apply with either a flat badger or a soft-point half-elastic flat bristle brush. A dense, solid yellow will result from this method of employing any of the various tones and shades of yellow.

Any of the standard reds should give solid effects without much coaxing. Lay English vermilion over a peach-blow ground color. If desired it may be put over a blank white ground. Never employ oil in preparing the vermilion. Oil is fatal to the appearance of many of the reds. Use the first coat of vermilion as a flat color, employing a little rubbing varnish for a binder. Then for second coat make it in the form of a moderate color. Yellows and reds over proper grounds are easy colors with which to produce solid covering effects.

USE OF WHITE LEAD STOPPING

The Coachmakers' Society at Adelaide, Australia, recently gave special attention to the question of the risk attending the use of lead in vehicle painting. The trade was circularized, and a largely attended meeting resulted. It was rightly recognized that danger was almost entirely in connection with the inhalation of dust arising from the use of white lead sand paper

stopping. After an interesting discussion the following resolution was carried, a copy of which the secretary was instructed to forward to the various coach and motor car firms: "That in the opinion of this meeting the use of dry white lead, known as sand paper stopping, is fraught with danger to those using it, is detrimental to health, and its effect is shown in after years. We therefore respectfully ask that its use be discontinued in the painting of all vehicles running on road or rail."

RED PAINT TESTED ON LIGHT VESSEL

All sorts of weather conditions failed to cause any perceptible fading of a new brand of paint which was applied to Fire Island Light Vessel, New York, in June, 1914, and was exposed to the elements for ten months, during which the craft was continuously on station. The Bureau of Lighthouses reports that the paint showed up a bright red at the end of that period and gave the vessel a very conspicuous and neat appearance.

A test of this paint was also made on several nun buoys in the seventh and eighth lighthouse districts, where the action of the weather on red paints has been found to be severe because of the unfavorable conditions as to heat and moisture, and after a period of several months it was reported that the paint had not faded, and that the buoys were being commented on favorably on account of their bright color.

OUR MINERAL PAINTS

According to the annual statement on the production of mineral paints, now available for distribution by the Geological Survey, the United States produced 66,766 short tons of natural mineral pigments in 1914, having a value of \$473,036.

OVERLAND TO ADD TWENTY-THREE ACRES OF FLOORSPACE

Additions being started at the Overland factory at Toledo, O., will be equivalent to almost 23 acres of floor space. In addition to the factory extensions, there will be a new office building 63 x 373 feet.

One of the new factory structures will contain 20 acres of floor space and will be nearly three times the size of the original Pope plant, when taken over by John N. Willys, president of the Willys-Overland Co. This building will be five stories high, 400 feet wide and 400 feet deep. It will be used for final testing, body assembling and finishing and will contain 800,000 square feet.

The enameling department will have an extension put on it containing 3,500 square feet of floor space.

The pattern shop will be enlarged by a three-story fireproof addition, 83 feet wide by 100 feet long. This new building will add 25,000 square feet of floor space to the department. The dry kiln building will be increased in size by a two-story fireproof extension, 145 x 107 feet containing 31,000 square feet of floor space.

The original Pope buildings facing Central avenue will be rebuilt and enlarged by 53,000 square feet of floor space. They will be made fireproof throughout.

The old wooden buildings will give way to a new administration building. The plans call for a seven-story fireproof structure, made of steel and tile throughout and containing 165,000 square feet.

Although the production of the Overland company is larger than ever before in its history, and is steadily increasing, the factory finds it impossible to gain on the orders pouring in from all sections of the country.

CELLON

This is the name of a new material which is claimed to be an excellent substitute for glass. It is understood to be somewhat of the nature of celluloid. It can be bent without break-

ing, and a sheet of celloid may be ignited by an open flame, but the burning portion, says the Scientific American, will melt, and a few drops of the substance will fall to the ground, but it will not continue to burn. A plate 60 by 140 cm. 1 mm. thick weighs a kilogramme, or 2.6 oz. per 100 sq. in. of .04 in. thickness. From this data the specific gravity works out at approximately 1.07. Celluloid is somewhat heavier, the specific gravity being approximately 1.44. Cellon can be fastened with nails, or sewn in as with celluloid. It can be cut and trimmed with a knife, and can be molded after heating in warm water. It is also stated that it is impervious to water, gasoline, oil, and turpentine. The process of manufacture is patented.

INCREASE OF FORTY-THREE PER CENT.

Reports from the Sheldon Axle & Spring Co., Wilkes-Barre, Pa., covering the fiscal year ending September, 1914, show an increase in the business of the worm gear axle department of 43 per cent. over the preceding year which in turn was 23.5 per cent. higher than the year 1912. From September, 1914, to date an increase of 42 per cent. over the corresponding period of 1914 has been shown.

To meet the increasing demands added space and equipment have been gradually added and within the past few weeks two 92-inch grinders have been received as well as two additional oil fires in the drop forging department. Within the next 30 days a considerable run of floor space will be added to the worm gear department to take care of the enlarged line. Announcement also has been made at the factory that the five-ton capacity worm gear axle was ready for delivery early in June.

ENLARGING TRUCK PLANT

It is reported that the extensions planned for the Reo Motor Truck Co. are to be larger than at first considered. Work is now in progress on a 4½ acre tract, to be devoted to truck business. The company is now shipping 15 two-ton trucks daily.

The expansion will include an addition to the general assembling department of a three-story structure 101 x 256 feet, the final assembly department will be increased by a building three stories high and 115 x 138 feet, and the present assembling building will be increased by two additional stories, 80 x 153 feet. A three-story addition, 50 x 74 feet, will be added to the engineering building. Shipping facilities are to be greatly increased through the construction of a loading dock along the Grand Trunk railroad, 347 feet long and 36 feet wide.

MONTREAL LIMITS MOTOR TRUCKS

A by-law regulating heavy traffic without springs was passed by the Montreal, Que., city council recently which provides that the traffic of motor trucks and vehicles not on springs, used for the conveyance of heavy burdens, whether the same be loaded or empty, is prohibited on University street. Such prohibition, however, shall not apply to such motor trucks or vehicles used for the different municipal services required in said street, to motor trucks or vehicles conveying heavy burdens which are deposited at or removed from any place on the said street. Motor trucks used for the conveyance of effects, goods or materials, whether loaded or empty, shall not be driven in the streets of the city at a greater speed than four miles an hour.

TO MANUFACTURE IMITATION LEATHER AT ATHOL, MASS.

Athol, Mass., will be the home of a new industry which will be launched immediately, according to a statement given here by L. S. Starrett, of the L. S. Starrett Tool Co. The new concern, which will be called the Athol Mfg. Co., has been organized under the laws of Massachusetts with a capital of \$200,000,

with \$100,000 preferred stock and \$100,000 common. The company will manufacture imitation leather chiefly for automobile tops. It will also manufacture rubber fabrics which will be made into raincoats and blankets. L. S. Starrett, of Athol, will be president of the Athol Mfg. Co., and J. D. S. Everett, of Athol, will be treasurer. The new company will take possession of the old Millers River Mfg. Co. factory.

MOTOKART MFG. CO. ORGANIZED

The MotoKart Mfg. Co., Marbridge Building, New York City, has been incorporated with a capital stock of \$500,000, to continue the business of the MotoKart Company, and has acquired all patents, materials, etc., of the latter company. It will take title to a manufacturing site at Scranton, Pa., and will erect a factory containing 200,000 square feet of floor space. Plans call for the erection of three buildings; two, 60 x 300 feet; one, 60 x 260 feet, each three stories; a power plant, 40 x 80 feet, and a three-story storage and office building, 60 x 250 feet. The first building will be the general machine shop. Pending the completion of the plant, it is negotiating contracts for the delivery of parts which it will assemble at the rate of five or ten cars a day. A. R. Gormully is president and general manager, and H. E. Steinbock, chief engineer.

AHEAD IN EXPORTS

It is the prevailing opinion that the exports of this country to South America are a mere bagatelle compared to those of Germany and Great Britain. On the contrary, the United States exports more merchandise to South America than does any other nation. Today, of course, we export to the Latin-American countries far more than both England and Germany, but our exports exceeded either before the war began. For the year 1913, the latest year upon which figures are available, the exports to South America from the United States were \$325,837 345; from Germany, \$217,967,202; from Great Britain and Ireland, \$322,228,073.

The export trade of Great Britain has been acquired by high quality and durability, that of the United States by improvements in construction and lightness as well as gracefulness, and that of Germany by cheapness and often at the expense of quality.

FIXING THE AMOUNT OF GRANT PATENT DAMAGES

The Diamond Rubber Co., of New York, must pay the Kelly-Springfield Tire Co. \$212,376.29 for infringement of the Grant patent on an imbedded-wire solid tire. The Federal court has confirmed the accounting. This marks the end of 18 years of litigation, since the beginning of which both parties have changed. When the suit was brought Kelly-Springfield was the Consolidated Rubber Tire Co. and the defendant is now a Goodrich property. The patent, No. 554,765, expired February 18 1913.

The accounting is made up as follows: Damages, \$130,391.75; extra award by the court, \$50,000; interest, \$28,709.60; costs, \$3,274.94. Other suits in the accounting stage are against Goodrich and Republic, in Chicago, and against the Pennsylvania Rubber Co., in Pittsburgh.

COOK TO PLACE GARFIELD MONUMENT IN CINCINNATI

The task of supervising the placing of the Garfield monument in its new position in Garfield Park, Cincinnati, O., has been intrusted to Louis Cook, an assistant of the city engineer. Mr. Cook is a great admirer of the martyred President. He is the pioneer "cheap Cincinnati buggy" builder of the eighties.

One of the Cincinnati's cherished possessions is a letter

received by him from Garfield only a few months before the assassination. Garfield thanked Cook for extending congratulations over his election to the Presidency.

At that time Cook, who later became a wealthy carriage manufacturer, was General of the Garfield and Arthur Home Guards.

SPECIAL CENSUS OF HAMTRAMCK, MICH.

A special census of the village of Hamtramck, Mich., made at local request and expense, shows the population of that village on June 25, 1915, to have been 21,520. The increase since 1910, when the population was 3,559, has been 504 per cent. The present population comprises 21,242 whites and 278 negroes. The census was taken by local enumerators under the supervision of an official of the Bureau of the Census, Mr. Eugene F. Hartley.

Hamtramck is a suburb of Detroit, lying just to the northeast of that city. Its remarkable growth is due in great measure to the presence of large automobile factories within and near its borders.

AUTO FEES FOR YELLOWSTONE PARK—NO MOTORCYCLES

The U. S. Department of the Interior has issued complete regulations for automobile traffic in Yellowstone Park, beginning August 1. None but passenger vehicles will be admitted to the park. Tourists will be required to secure tickets for each trip through the park, the price of such tickets being \$5 for runabouts, \$7.50 for five and \$10 for seven passenger cars. The speed limits are 12 miles per hour ascending grades, 10 miles per hour descending, and 8 miles approaching curves; 20 miles per hour is permitted on open level stretches with no teams nearer than 200 yards. Cars must be taken off the roads in case of accident or moved to the outer edge if that is impossible. Horns must be sounded on approaching curves. Autos may leave the park by any one of the authorized routes.

COURT REDUCES JUDGMENT AGAINST HAINES

The United States circuit court of appeals at Cincinnati, O., in the case of H. H. Haines against the Buckeye Wheel Co. and the First National Bank, of Middletown, decided in favor of Receiver Haines. The case grew out of the receivership of the New Decatur Buggy Co. It was alleged that Haines, as receiver, made unauthorized expenditures and wasted the assets of the company. The suit by the Buckeye Wheel Co. and other creditors was brought for the purpose of compelling Haines to pay certain claims, and the lower court awarded a judgment against him. It is now decided that by reason of the withdrawal of charges of negligence and mismanagement on his part, the amount to be paid by him is much less than that awarded by the lower court.

FOUR WHEEL DRIVE TRACTOR

The Utility Steel Tractor Co., of Antigo, Wis., is making successful trial of a new four-wheel drive gasoline tractor. The tractor has a draw-bar pull of about 5,000 pounds and is said to be able to pull from six to eight plows. The ideas embodied in the new tractor belong to D. S. Stewart, of Antigo, and N. C. Woodin, of the same city, is the designer of the machine. Power is applied to all four wheels by means of a shaft and pinions that mesh with cogs on the inside face of the wheels. Only two universal shafts are used. No weight rests on the drive shafts. The tractor steers with all four wheels and will turn in a 20-foot circle. The engine used is a four-cylinder heavy duty tractor type developing 40 horsepower at 800 revolutions per minute.

HORSES AND MULES FOR EXPORT

Horses and mules constitute large exports from the United States at present. The annual average shipped abroad for several years has been 28,000 horses, average value \$142, and 5,000 mules, average value \$150. During the ten months ended April 30, 1915, exports of horses numbered 215,759, valued at \$47,783,848, or an average of over \$220 per animal, and 39,229 mules, valued at \$7,478,014, or over \$190 per head. As pointed out in Commerce Reports for February 13, 1915, these animals can readily be spared, the United States having over 24,000,000 horses and 5,000,000 mules. The big foreign demand for work animals will probably occur after the war, when they will be needed for farming.

WATSON CO. TO PRODUCE MOTOR TRUCKS

The Watson Wagon Co., Canastota, N. Y., which for many years has built contractor's wagons, and which recently adapted a type for use as trailers with motor trucks, has begun the production of what is known as a "front drive truck." This is a Walter two-wheeled tractor, supporting the front end of a Watson 7½-ton bottom dump trailer, the whole unit being one rigid vehicle. The front wheels carry the power plant and one-third of the load while 66 per cent. of the pay load is carried on large diameter steel tired trailing wheels. The power connections are very short and large brakes are attached to the rear wheels. Great tire economy is expected from the fact that only the front wheels have rubber shoes.

EXPORT HORSE TRADE

England has 35,000 horses concentrated at various points in the United States, and the feed bills are burdensome, not to speak of risk. Orders were received from London reducing British acceptances to 50 head daily for each inspection, which means a two-thirds reduction from maximum volume. At one time British inspections were taking 125 to 150 head daily, and reduction heralds a drop in prices. The French are still buying freely at \$130 for riders \$160 for medium gunners and \$175 for big gunners. In the British inspection \$150 to \$200 is taking everything from riders to gunners. Commercial demand is not expected to revive until September.

NATIONAL SPRING & WIRE ADDITIONS

About \$100,000 is to be spent by the National Spring & Wire Co., manufacturer of seat springs, in enlarging its plants at Albion, Mich., and Windsor, Canada. The additions to the Albion plant will consist of a two-story building, 294 x 60 feet, which will be an enlargement of the machine shop. A small section of the new structure will be only one-story high and will be used for enameling ovens and dip room. Another addition, 146 feet long, now nearly completed will include the new offices and tool rooms. A new building recently completed as a storeroom, will be fitted with machinery and become a part of the machine shops.

DEATH OF WILLIAM P. HOLDEN

At Fort Wayne, Ind., June 28, occurred the sudden death of Wm. P. Holden, a well known and popular traveling man. He was, for about 18 years, connected with the Searls Mfg. Co., Newark, N. J., but during the past two years represented the Howell-Hinchman Co., of Middletown, N. Y. Mr. Holden until recently enjoyed the best of health, but for five weeks prior to January 18, he was in the Battle Creek Sanitarium suffering with clerosis, or hardening of the arteries. He was of a cheerful, genial disposition and had many friends among the carriage and automobile trade, who will be shocked to learn of his sudden death.

WITT'S SONS MOVED TO KNOXVILLE

The sons of H. L. Witt, of W. L. Witt & Sons, Morristown, Tenn., have moved the plant to Knoxville, where it will be known as the Chilhouer Wagon Co., at Chilhouer Park. Since the death of H. L. Witt the company's business had fallen below normal and the sons decided to start anew. The new concern is backed by K. G. Barkout, who has leased Chilhouer Park to the city for 20 years, and will specialize on building circus wagons and cages. It is a new line in that section but the firm looks for success. Oak, ash and poplar will be used for cages and hickory for the axles.

PROPER ALIGNMENT BEST TIRE SAVER

Numerous tests have shown that a tire on a front wheel, which is slightly out of alignment, will wear off much faster than it should. In extreme cases it has been found that running a car for less than 100 miles, with the front wheels improperly aligned, will completely wear down the tread of the best tire. The best "tire saver" for the average motorist who drives his own car, says Scientific American, is to invest in one of the various devices on the market, insuring absolutely proper alignment, both as to height and to divergence from the parallel lines. The price is ridiculously small when compared to the saving in tire expense.

DU PONT FARMERS' HANDBOOK

We have received a copy of the Farmers' Handbook, containing some 190 pages of interesting and instructive information for all who are interested in the application of explosives to modern farming. There are many illustrations, and one is presented with ample evidence of good results obtained through the judicious use of blasting powders.

We are sure that farmers or others with problems or difficulties confronting them, such as a field of tree stumps or giant boulders, will readily find a solution in this very complete and handy volume. It is free for the asking, of Du Pont de Nemours Powder Co., Wilmington, Del.

ERDMAN-GUIDER CO. ORGANIZED TO MAKE BODIES

The Erdman-Guider Co. has been organized at Detroit, Mich., to make special automobile bodies and do a general automobile trimming, repairing and painting business. The concern has leased the old Herreshoff Motor Car Co. plant at 2290 Woodward avenue. Those interested in the new concern are A. R. Guider, president and business manager, who during the past ten years was manager of the R. Heischel Mfg. Co. Saginaw, Mich.; Charles Erdman, vice-president, who was vice-president and assistant general manager of Seivers & Erdman; H. L. Morrison, secretary-treasurer, who was connected with the accounting department of the Riverside Storage Co.

HERBRAND CO. TO ENLARGE

The Herbrand Co., Fremont, O., will build a \$20,000 addition to its plant. An enlargement of the factory has been made necessary by large orders for automobile parts from the Ford Company, of Detroit, and other concerns. The company is so rushed with orders that a three-shift working schedule has been adopted.

HAITI'S 1914 PURCHASE

During 1914 the United States exported to the republic of Haiti, 60 buggies, 40 carts, 422 cases of materials, 50,000 spokes, 43 pairs wheels, 30 pairs lamps, 38 curtains for buggies, and 703 yards of cloth for lining. 3,230 pounds carriage axles were also exported to the West Indian island.

FORD BUYS 1,000 ACRES OF IRON ORE LAND

Henry Ford has purchased a tract of 1,000 acres of iron ore land near Oakwood, Mich., on which he purposes to develop mines and establish furnaces for reduction and mills for manufacturing steel, which will be used for the building of farm tractors. The plan comprehends the employment of a large number of men, one estimate being 20,000. The development is not to be undertaken immediately.

PATERSON BRINGING OUT NEW SIX

The W. A. Paterson Co., Flint, Mich., is bringing out a new light six at \$985 for the five-passenger and \$1,060 for the seven-passenger model. The motor is a Continental, $3\frac{1}{4} \times 4\frac{1}{4}$ in. Wheelbase is 117 in. and tires are 32 x 4. The carbureter is a Stromberg. The four-cylinder model will be continued and is the same, except in minor details. The price of this car is reduced from \$1,095 to \$985.

OHIO LIMITS TRUCK SIZES

A new Ohio law sets a limit of 3,400 pounds for the weight of any vehicle driven on stone, brick or macadamized road which has a tire less than three inches in width. If the vehicle weighs more its owner must secure the permission of the county commissioners before it can use the roads. Flanges and lugs on the wheels cannot be used.

WEIGHT LIMIT IN BALTIMORE

An ordinance has been passed by the Baltimore, Md., city council forbidding any truck weighing more than 12,000 pounds with load to pass over the city bridges, and the owner of any truck that weighs more than 14,000 pounds must obtain the permission of the city engineer for it to be driven through the streets of the municipality.

RUSH ORDER FOR 2,000 ROAD CARTS

George B. Kunz, receiver for the James & Meyer Buggy Mfg. Co., at Lawrenceburg, Ind., has received a rush order for 2,000 road carts from South America. The carts are of a special make, high wheels, some to have one and others two seats, and are to be drawn by two horses. The factory will begin full operation at once to fill this order as soon as possible.

AUTOMOBILE LOANS

At the convention of the Wisconsin Bankers' Association during July, it was brought out that there is an investment in automobiles of some \$70,000,000 in that state, 90 per cent. of which has been withdrawn from banks, either by withdrawal of deposits, money borrowed or notes purchased. This condition has caused a shortage of capital.

GRAMM-BERNSTEIN HAS 1,250 FOREIGN TRUCK ORDERS

S. A. Gramm, vice-president and general manager of the Gramm-Bernstein Co., Lima, O., is authority for the statement that orders for 1,250 motor trucks are on the books of the company at this time and that considerable additional business had to be turned down because of lack of capacity. That is being remedied, however, and additions and extensions are under way which will be completed in October of this year which will largely increase the capacity.

The company has already shipped 300 motor trucks to foreign countries, such as France, Roumania, India and Russia. A large proportion of the orders now on the books are from foreign nations.

The company is now shipping trucks at the rate of 150 per month, and when the machinery is installed in the new additions the number will be increased to 250.

LOTS OF BUGGY REPAIR YET

We are too prone to believe that the horse-drawn vehicle is being crowded out, but that seems far from the case when we consider that there were 2,200,000 top buggies sold in the United States alone during 1914. This would seem to prove that there is a whole lot of woodwork for most of us yet, despite gasoline and the coming of the engine-driven vehicle.

PURCHASE CANTON BUGGY CO. STOCK

The entire stock of buggies of the Canton (O.) Buggy Co. has been purchased by Garver Bros., of Strasburg, who will dispose of it in a big sale. It is reported that Mr. Schantz, manager of the Canton Buggy Co., has decided to enter the automobile business.

MICHIGAN BUGGY DIVIDEND

Creditors of the Michigan Buggy Co., Kalamazoo, Mich., who already have received a dividend of 20 per cent., are soon to receive an additional 2 per cent., the order having been issued by the court. It is reported that this will be the final payment as it will exhaust the assets of the defunct company.

REO TO ENLARGE PLANT

Three new buildings to cost \$250,000 will be erected by the Reo Motor Car Co., at Lansing, Mich., this fall, according to an announcement made by the officers of the concern. One will be used in manufacturing trucks.

HENNEY BUGGY CO. TO RESUME OPERATIONS

According to announcement in a local paper the Henney Buggy Co., of Freeport, Ill., will resume operations in its body department, August 10.

In order to produce 125 trucks a month for delivery to European armies, the Four-Wheel Drive Auto Co., of Clintonville, Wis., has broken ground for a new factory building. Its present output is 75 trucks a month.

C. B. N. A. 1915 CONVENTION
CLEVELAND, O., SEPT. 20-24

Trade News From Near and Far

BUSINESS CHANGES

Jacob Young has purchased the wagon repair shop of S. R. Walls, at Lewiston, Ill.

C. M. Beldon is closing out his vehicle harness and implement stock at Spencer, Ind.

Chas. E. Strode, dealer in auto supplies and vehicles at Hannibal, Mo., has sold out to L. G. Wilhelm.

W. J. Sommerfield, Neillsville, Wis., has sold his interest in the Korman & Sommerfield Wagon Works to a Mr. Gandt.

Howard J. Moody, buggy and harness dealer at Perry, Ia., has sold out to H. C. Senff, who was formerly a harness dealer at Creston.

The Ligonier (Ind.) Carriage & Buggy Co. will soon go out of business, as the Banta & Bender Co. has purchased their large factory.

John H. Weaver, of Winamic, has taken possession of the implement and vehicle store that he recently purchased from J. Neumann Co.

Burl Eliker, in the retail implement and vehicle business at Greenville, O., with Searl & Eliker, has sold his interest to Forrest Murphy.

Fred Goodyear has purchased the interest of his partner, Jesse Hohan, in the vehicle and implement firm of Hohan & Co., at Plymouth, Ind.

T. B. Scholes & Son, Danville, O. (post office, Buckeye City), succeed Strausbaugh & Scholes in the implement, buggy, wagon and harness business.

C. M. Grimm has sold out his implement and buggy business at Lecelle, Ia., to the firm of Armagost & Davis which was formerly in the garage business at Osceola.

J. M. Brown, of St. Charles, Ia., has sold out his implement and vehicle business to J. H. Beamer, who was formerly in the garage and automobile business at Macksburg.

George Popp has purchased the wagon building business at Clay street, Carlisle place and Mt. Pleasant avenue, Newark, N. J., which was formerly conducted by E. H. Oliver.

Ambrose & Knight, hardware and vehicle dealers at Urbana, O., have dissolved partnership. W. J. Knight retires from the business which has been taken over by J. W. Ambrose.

The firm of Hornaday & Long succeed Hornaday & Son in the buggy and farm machinery business at Milo, Ia. P. F. Long, the new member of the firm, has been a successful farmer.

F. H. Otto, pioneer dealer at Galva Ia., has sold out his implement and vehicle business to the firm of Fahr & Staut. He will give possession January 1, 1916. Mr. Fahr, of the new firm, is a well-to-do farmer living near Alta.

NEW FIRMS AND INCORPORATIONS

Ed Ryg is a new vehicle dealer at Slater, Ia.

W. P. Morrison is a new dealer in implements and buggies at Shepherdstown, W. Va.

E. B. Shore is a new vehicle and implement dealer at Williamsburg, Ia. Mr. Shore was formerly a successful farmer and horse buyer.

J. Miller Gaston and J. H. Andrews are new dealers in implements, automobiles, wagons and harness at 648 St. Clair avenue, East Liverpool, O.

A new implement and vehicle store has been started at Colfax, Ind., by John Hadsall, who is adding this line to his automobile and garage interests.

Austin & Son have opened a new implement and vehicle store in Tuscola Ill. The company will handle a complete line of farm implements, buggies, wagons, etc.

NEWS OF THE TRADE

The Defiance Machine Works, Defiance, O., has put its plant on double shift owing to the large volume of work on hand.

The Empire Axle Co., Dunkirk, N. Y., plans either to acquire a building to enlarge its manufacturing capacity or to erect one. William C. Blackham is secretary.

The National Limousine Top Corporation, Buffalo, N. Y., has leased factory premises at 41 Letchworth street, and is equipping it for the manufacture of automobile tops, etc.

The Fleetwood Metal Body Works, Fleetwood, Pa., has had plans drawn for factory buildings, 70 x 110 ft., 40 x 299 ft., and 40 x 144 ft., all 2½ stories, of brick and steel, to cost about \$40,000.

The Houk Mfg. Co., Buffalo, N. Y., manufacturer of wire spoke wheels for automobiles, has completed plans for an addition to its plant at Elmwood avenue and the New York Central railroad belt line.

E. & R. Preisendanz, 15 Market street, Camden, N. J., wagon manufacturers have had plans drawn by J. C. Jefferis, 1001 Chestnut street, Philadelphia, for a four-story factory, 96 x 100 ft., of reinforced concrete.

John B. Ross, president of the Thomas Graham Co., of Madison, Ind., manufacturers of spokes for vehicles and wagons, is contemplating the erection of a new plant to take the place of that burned on June 27.

The Austin Company, manufacturer of automobile axles, Grand Rapids, Mich., heretofore conducted as a partnership by James E. Austin and Walter S. Austin, will be incorporated with a capital stock of \$1,000,000.

The Gramm-Bernstein Co., Lima, O., has just received an export order for 500 four-ton motor trucks. It has awarded to the Champion Iron Works, Bellefontaine, O., a contract for an addition to its plant 50 x 200 feet.

The Rock Island Implement people have discontinued the sale of the Winona wagon, which has been handled by them for the past year, that they might make room for the new Rock Island wagon made in their own shops.

The Chevrolet Automobile Co. will soon be ready for bids for construction of a two-story factory to be built at Tarrytown, N. Y., at an estimated cost of \$40,000. W. C. Durant, 816 Eleventh avenue, New York City, is president.

The Elmira Commercial Motor Car Co., Elmira, N. Y., has been incorporated with a capital stock of \$500,000 and will manufacture auto trucks, etc. Henry Bush, Albert Von Beaulieb and George Gebbie, of Elmira, are the directors.

The Sternberg Motor Truck Co., Forty-sixth avenue and Rogers street, West Allis, Milwaukee, has changed its corporate title to the Sterling Motor Truck Co. The company is working on large war orders for trucks and making shipments almost daily.

A heavy storm which broke over Owensboro, Ky., recently, blew over a large metal stack at the plant of the Ames Carriage Co., and did other damage to the plant. Work was started on

a new stack shortly afterward, and operations held up only a short time.

The Fabric Leather Co., Reading, Pa., will soon start the erection of a plant for the manufacture of artificial leather. Henry A. Meers will have charge of the factory, and he, with Edward A. Aurebach, 439 Penn street, Reading, and P. O. Reed, are the organizers.

The Warren (O.) Motor Truck Co., recently incorporated with a capital stock of \$25,000 has taken over the equipment of the Standard Motor Truck Co., Warren, and will occupy the plant used by the defunct Standard Company. R. B. Wick is president and L. L. Jones, secretary.

The Puritan Machine Co., Detroit, Mich., has purchased all of the assets, except the real estate, of the bankrupt Briggs-Detroit Co., automobile manufacturer, at receiver's sale. It is the present intention of the company to reorganize it and continue the manufacture of motor cars. A. O. Dunk is president.

A new automobile company, the name of which is at present withheld, will establish a plant in Cleveland, O., and has acquired a site on East Seventy-ninth street. The contract for the first building providing about 25,000 square feet of floor space, will be let in a few days. The plans are being prepared by the National Engineering Co., Marshall Building.

The Chevrolet Motor Co., Flint, Mich., automobile manufacturer, has broken ground for the erection of a plant which will be used to manufacture motors exclusively. It has also acquired stock control of the Mason Motor Co. and will operate its factory in connection with the new plant. About 20 acres of land adjoining the present plant of this company has been acquired for future expansion.

The Chandler Motor Car Co., Cleveland, O., will enlarge its plant by the erection of a one-story steel and concrete building, 120 x 400 ft., a one-story concrete building, 60 x 200 ft., designed to permit the addition of three more stories, a boiler house, 40 x 60 ft., and the addition of a second story to the office building, 40 x 120 ft. Two 15-horsepower return-tube boilers for heating purposes, will be required for the boiler house.

REDUCTION ON FORD CAR PRICES

The Ford touring car will be sold at \$440, and the roadster at \$390, beginning with August 1. This is a reduction of \$50 on each model as compared with the existing price during the past year.

The company announces that no rebate is to be given persons buying Fords during August, September and October, but that it is possible a rebate will be decided upon later when the exact cost of manufacture etc., which cannot be determined for several months, has been calculated. It is claimed that the roadster will be produced in much greater quantities than during the past year.

WAGON HAULS

An inquiry just completed by the Bureau of Crop Estimates of the United States Department of Agriculture shows an average distance from market of 6.5 miles for the farms of the United States, while those rarer instances average 8.7 miles. The number of round trips per day averages for all farms 2.1, and for the more remote farms 1.6 trips; in other words, it requires about half a day for the average farmer to make a round trip with wagon from farm to market and back and averages nearly two-thirds of a day for the farmers who are farthest from market.

NEW IDEA IN RADIATORS

A French patent for radiators makes use of a vertical radiator which is placed behind the car hood. Radiator is flush with

top and bottom of hood, and consists of sets of vertical air tubes of square section which run through the liquid and from top to bottom. Air enters the top through a suitable open mouth directed toward the front, passes down through the tubes and leaves at the bottom. Circulation is aided by a small fan which is mounted on a horizontal shaft just under the radiator tubes, this fan having the shape of an elongated paddle-wheel. Long trajet of the air produces high cooling effect.

ENORMOUS GOODYEAR OUTPUT

A single day's production by the Goodyear Tire and Rubber Co. recently reached 15,447 tires. The company had been the first to set records of 5,000 and of 10,000 tires for a one day's output. The lower prices announced on motor cars for the coming year indicates an unprecedented demand for tires and P. W. Litchfield, factory manager of the company, expects that very shortly a production of 20,000 tires a day will be necessary to keep pace with the demand.

HERE'S TO THE HORSE

Racing at Saratoga, polo at Narragansett, horse shows at Long Branch and other points throughout the country have all been attended with so much social eclat and popular attendance, together with spirited contests that enthral the spectators, as to indicate this to be one of the most successful, and, in fact, brilliant seasons for the horse in many years. The prospects are that with the coming of cool weather in the fall similar affairs will excel in splendor and public interest.—Rider and Driver.

PERSONAL

Frank C. Smith, for five years general sales manager for the Banner Buggy Co., of St. Louis, traveling throughout the south and west, will become sales manager for the Detroit-Dort Carriage Co. and the Dort Motor Car Co., of Flint, Mich.

W. C. Collins has assumed the duties of vice-president and sales manager of the Pekin (Ill.) Wagon Co., a position created for him. Mr. Collins was for nine years sales manager of the Keystone Steel & Wire Co., of Peoria.

STUDEBAKERS MAY OWN LIGONIER CARRIAGE PLANT

It is currently reported at Ligonier, Ind., that the Mier Carriage Co. of that place has been purchased by the Studebaker Corporation of South Bend. Local officials declined to make any statement. The Ligonier concern has been idle for some months, but recently put 50 men to work. The sudden resumption of the plant is believed to be due to its absorption by the South Bend concern.

NEW CORPORATION FORMED

Buffalo and Lackawanna have been decided upon as the location of the Sun Motor Car Co., a new corporation organized for the purpose of manufacturing a light six cylinder car which will sell at considerably less than \$1,000. The capital stock of the new company is \$750,000 and incorporation papers have already been filed at Albany with the secretary of state. The entire capital stock has already been subscribed.

WAGON COMPANY TO BUILD AUTO TRUCKS

The Hannibal (Mo.) Wagon Co. will build and put on the market a commercial auto truck the price of which will be not much above \$500, according to an announcement made by Manager N. L. LeBlond, in a local publication.

OBITUARY

John A. Stewart, 60, well known as a carriage manufacturer in Boston and Cambridge, Mass., died July 13 in Cambridge. He had been ill since early spring, when he left his quarters at the Revere House and went to a hospital for treatment. About six weeks ago he returned to his business for a short time, but had to give up again. He had the principal interest in the carriage manufacturing firms of Stewart Brothers & Co., 448 Main street, Cambridge, and Kimball Brothers Company, 112 Sudbury street, Boston. He had lived at the Revere House for seven or eight years.

DEATH OF A. R. PARDINGTON

A. R. Pardington, vice-president and secretary of the Lincoln Highway Association, of Detroit, Mich., who for the past two years looked after the management of the association, died at Parker Hospital, July 28, where he had been ill for some weeks. For several years Mr. Pardington has suffered with a malignant disease which had seriously handicapped him. He was instrumental in the building of the Motor Parkway, Long Island, and has long been connected with automobile sports, having refereed all of the 500-mile races on the Indianapolis Speedway.

CHARLES ECKHART NEAR DEATH

Honorable Charles Eckhart, wealthy manufacturer and benefactor, of Auburn, Ind., is lying near death as a result of an attack of apoplexy which he sustained July 14. Word from his bedside is that Mr. Eckhart is growing weaker. The millionaire, some time ago, gave Auburn a \$20,000 Y. M. C. A. building and a few weeks later announced the gift of the same amount for improvement of the city park at Auburn.

REVIVAL IN ROAD BUILDING

A genuine revival in road building has started in several states, especially near the proposed Dixie Highway. Most of these roads will connect with that highway, which in sentiment and utility makes appeal to the south. From Tennessee comes the proposal to reconstruct the highway running from Knoxville to Bristol used by Andrew Jackson in stage coach days on his journeys to Washington. In honor of him it is to be called the "Old Hickory Road."

NEW BODY COMPANY ORGANIZED

The Detroit Weatherproof Body Co. has been incorporated with a capital stock of \$10,000. The officers of the new concern are C. Haines Wilson, president and treasurer; Lawrence Moore, vice-president and general manager; George D. Wilson, secretary. Temporarily the headquarters of the company will be at 500 Clay avenue. The new concern will make limousine tops, commercial car bodies and will also market a special Ford body.

CINCINNATIANS WILL ATTEND CONVENTION IN SPECIAL CAR

The Carriage Makers' Club, of Cincinnati, is preparing to attend the convention of the Carriage Builders' National Association in Cleveland, O., September 20-25. It is said that a large percentage of the membership have endorsed the proposition of attending in a body. Special cars containing every convenience will be provided for the comfort of the guests.

WANTS

Help and situation wanted advertisements, 1 cent a word; all other advertisements in this department, 5 cents a word; initials and figures count as words. Minimum price, 30 cents for each advertisement.

PATENTS

Patents—H. W. T. Jenner, patent attorney and mechanical expert, 606 F St., Washington, D. C. Established 1883. I make a free examination and report if a patent can be had and exactly what it will cost. Send for circular.

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A successful carriage factory is going into the automobile business and wants strictly high-class man for an executive position, Secretary or Sales Manager. Will sell an interest to the right man. None but the highest class men with big capacity need apply. Address "Automobile," care The Hub.

ILLINOIS WHEEL TAX IN EFFECT

Illinois motorists will now have to pay the wheel tax under the new law passed by the legislature. The first enactment was declared unconstitutional and the payment of the tax was not required during May and June. Only 84 per cent. of the tax need be paid for 1915. For vehicles under 35 horsepower the tax will be \$8.34 instead of \$10. Higher powered cars must pay a proportionately higher rate.

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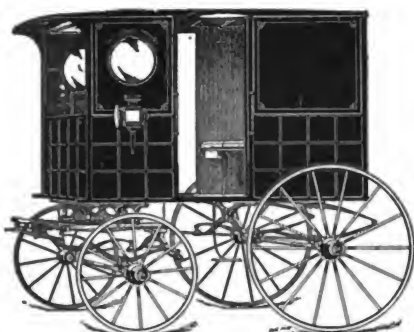
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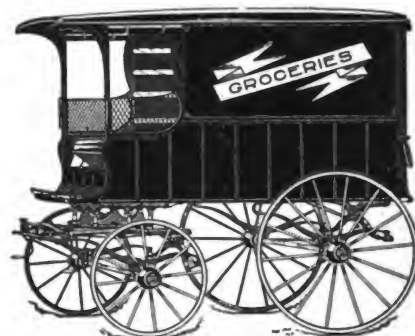
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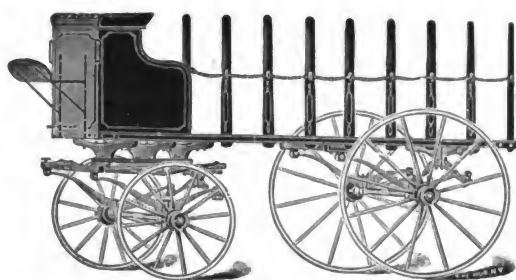
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No. 111.—Altman Wagon.



No. 113.—Grocery Wagon.



No. 122.—Flour Truck.

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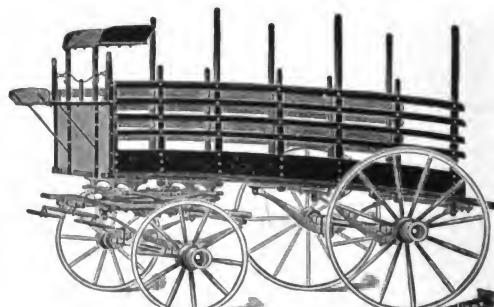
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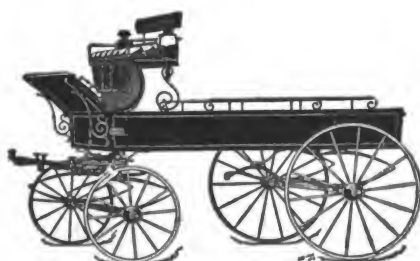
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No. 117.—Merchandise Truck.



No. 114.—Delivery Wagon.



No. 124.—Delivery Wagon.



No. 118.—Ambulance.

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WHAT IT IS

The American Harness and Saddlery Directory

The 1914 Edition

An extra painstaking revision of the names (and other information as below) constituting the Retail Harness Trade, has been completed for this year's issue of the Directory, and we think the work is so important and worthy that the

1914 Price Is \$5 Per Copy

and it is very moderate for what is offered in a work that is

Indispensable for Reference

for copying of addresses, and for all purposes usual in a directory.

Just a Sketch of Its Contents

The list of the **WHOLESALE** and **JOBGING TRADE** is so arranged as to make it convenient to separate the association members from those not so recognized.

The **RETAIL HARNESS MAKERS** of the United States and Canada comprise the principal part of the Directory, arranged by State, Town and County, and in the large cities, the street and number is given. Those rating (approximately) over \$1,000 are marked.

A list of **HARNESS DEALERS** as distinguished from retail harness manufacturers, is also given. The value of this list to those who solicit the vehicle, implement, hardware and department stores will be readily appreciated.

A list is also published of **Export Commission Merchants**, giving the class of merchandise they handle.

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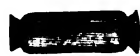
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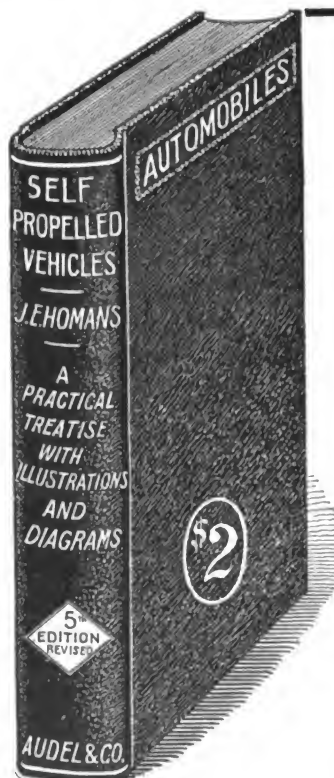
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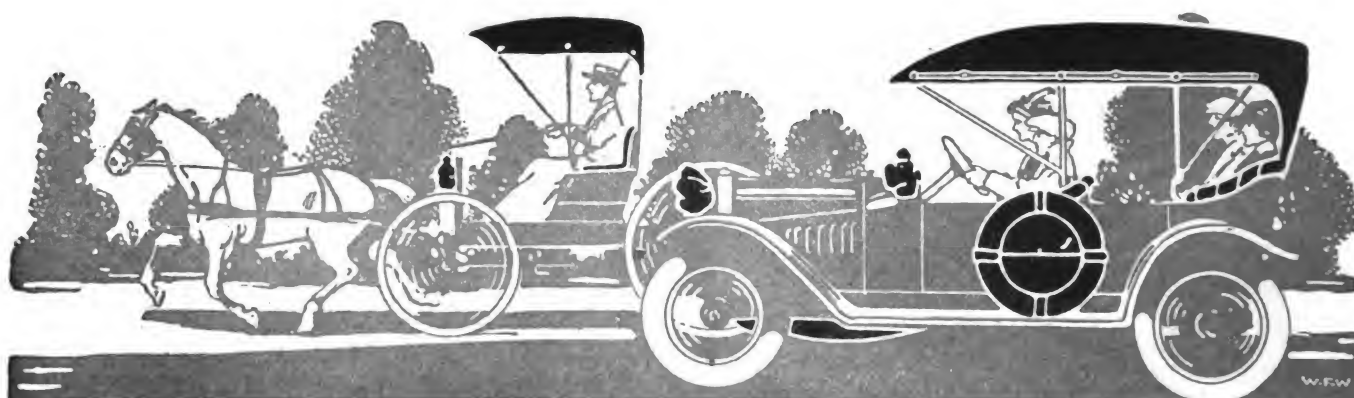
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The Hub

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Vol. LVII

SEPTEMBER, 1915

No. 6

THE TRADE NEWS PUBLISHING CO. OF N. Y. Publishers of THE HUB

J. H. WRIGHT, *President*

G. A. TANNER, *Secretary and Treasurer*

EDISON BUILDING, COR. ELM AND DUANE STS., NEW YORK

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THE HUB is published monthly in the interest of employers and workmen connected with the manufacture of Carriages, Wagons, Sleighs, Automobiles and the Accessory trades, and also in the interest of Dealers.

Subscription price for the United States, Mexico, Cuba, Porto Rico, Guam the Philippines, and the Hawaiian Islands, \$2.00, Canada, \$2.50, payable strictly in advance. Single copies, 25 cents. Remittances at risk of subscriber, unless by registered letter, or by draft, check, express or post-office order, payable to the order of THE TRADE NEWS PUBLISHING CO.

For advertising rates, apply to the Publishers. Advertisements must be acceptable in every respect. Copy for new advertisements must be received by the 25th of the preceding month, and requests to alter or discontinue advertisements must be received before the 12th day of the preceding month to insure attention in the following number. All communications must be accompanied by the full name and address of writer.

FOREIGN REPRESENTATIVES:

FRANCE—L. Dupont, publisher of *Le Guide des Carrossiers*, 78 Rue Boissiere, Paris. Subscription price, 15 francs, postpaid.

GERMANY—Gustave Miesen, Bohn a Rh. Subscription price, 12 marks, postpaid.

ENGLAND—Thomas Mattison, "Floriana," Hillside avenue, Bitterne Park, Southampton. Subscription price, 12 shillings, postpaid.

Entered in the New York Post Office as Second-class Matter

1895—Cleveland—1915

It was October 14—twenty years ago that the Carriage Builders' National Association gathered in Cleveland at the invitation of the local trade.

In those halcyon times the trade was in high feather, hence the gathering was so great that a banquet had to be provided for nearly 700 members and guests; fewer than 400 gathered around the hospitable board at Atlantic City last year, so this banquet measurement is a fair measure of the progress of the times so far as it affects the carriage men.

A consideration of Cleveland then and now is one of interesting contrasts. The 1895 meeting was one of the new departures of the time when the local committees took matters in their own hands as entertainers, and all the official functions of the association, save the progress of the meetings, was in the hands of the local hosts. As a rule it was the officials of the convention that arranged banquets, speakers and such minor matters, but in this instance Cleveland concluded to put itself in the sun, and make a place for itself in history. This brief account comprises the personal recollection of one who was "in their midst" in a sort of official capacity, and to whom the glorious record has not been forgotten even after 20 years. The incidents will be something like a handful of small change in the unevenness of the thoughts, but that is the trick memory plays—after 20 years.

The outstanding features are bigness of the gathering, interest in the course of events, enthusiasm of the mass, and notable features of entertainment, that will be touched upon as they arise in the review; and the all pervasive tactical skill of Generalissimo John McGrath, whom the Eberhard Company imported from his Cincinnati home (at that time) to run the dynamo of entertainment.

The Hollenden Hotel, in those days of unalloyed joy the most imposing hotel in the town, was headquarters. This year we again go back to the early love. Also, we will officially banquet under its roof—quite a contrast to the time 20 years ago when we had to hire a hall several blocks away from the hotel for that function, and even that hall had to be floored over a part of an alley for the banqueters.

Now that we are on the subject of the banquet let us, Chinese fashion, eat the dessert first.

It was a brilliant affair as an intellectual occasion, and horrible as a feast, owing to the difficulty of catering to the multitude without adequate equipment. The warming over of the viands out in the alley, the clatter of the dishes, the catch-as-catch-can features of the service will always leave a funny streak in fond recollection, but the brilliancy of the audience, the distinction of the speakers, and the difficulty of hearing much that was said in many parts of the pavilion, will always be remembered by those who were happy enough to be present and accounted for. Let us glimpse some of the speaking talent that the genius of local Cleveland management gathered together, and consider the subsequent public life of some of them. It will be a testimony to the power and influence of the carriage builders at that time.

Governor McKinley was the star. He was already in the spot light as a presidential possibility. Hon. R. K. Porter was not far behind, and Hon. J. F. Mack was more Ohio talent of the first magnitude. And for the first and only time, so far, we had the pleasure of listening to the stage, in the person of the distinguished actor W. H. Crane, a personal friend of President Channing M. Britton. Among our own members we had J. Seaver Page, who at that time was in the zenith of his Metropolitan reputation as an after dinner speaker. A funny incident attaches to Mr. Page. Mr. Britton, who as president, was the official toastmaster, felt the responsibilities of the occasion weigh so heavily, that he had a mild case of "buck fever," so induced Mr. Page to do the honors. Mr. Page did them so effectually that his introductions were actually speeches, and as one of the men introduced hinted, he had left him nothing to say on the subject assigned to him! The writer has an autograph menu of that dinner that is something worth while—20 years after.

Let us continue on the subject of feeds and finish them up, because it was one constant round of wassil. Three clubs, the Athletic, the Yacht, and the Masonic, threw open their doors to the members, and there were some good times behind the doors of all and several. There was something intermediate in the way of luncheons going on all the time, and everyone could not get away from the free hospitality of Cleveland.

Now who did all this? Here are the names of those responsible: S. E. Brown, W. B. Champney, C. F. Pratt, Charles E. Adams, G. A. Loughlin, and G. W. Luetkemeyer, with the ever present and pervasive John McGrath as secretary and treasurer, with especial emphasis on the last, as the funds were like the

water from the rock that Moses smitted, there was no end to the flow!

It is a curious commentary on the times that this year, for the first time, the banquet will be officially prohibition, the wine that cheers will cheer no more. It is bottled, and who put the stopper in the bottle? The chief advocates of the change are Messrs. C. E. Adams and W. P. Champney, with a strong following. What queer changes the whirligig of time does bring about! Twenty years wine in place of water, now water in place of wine, and the influence of Cleveland paramount in both movements. "The world do move."

Let us on with the dance and finish the measure of the entertainment specialties. Besides the banquet in the Cyclorama building there was a theatre party at the opera house, a sail to Put-in Bay, and then the star performance, the fight with soft gloves in the Cleveland Athletic Club on a Tuesday evening, a sort of curtain riser, as it were. This was the thriller and shocker, and was the front page feature and the talk of the rest of the week. It was provocative of the move that sent the association back to Puritan lines of demeanor for some years following. It was some fight, to be sure, and it was funny to note its effect on the audience. All subsequent fights have been on the floor of the convention, and everyone knows how peaceful that is.

Nothing better marks the mutation of time and the character of the men at the helm than to note the names of the members of the executive committee of that day. Here they are: C. D. Firestone, chairman; Lowe Emerson, Frank H. Hooker, C. F. Kimball, Millard F. Lane, Henry Timken and C. M. Britton (ex officio). Could one seek anywhere for a picture that so clearly marks the contrast between then and now. Of these men who were the very flower of the carriage trade, marking an era even then in its decline, but one, we believe, Mr. Emerson, is still alive. Those were the days of the pre-eminent individual builder—the old order—the dividing line between artistic excellence at top prices, and the quantity basis. President Britton expressed the feeling of the old regime in his opening address, one sentence of which was that "there seems to be a growing pride in our industry, in which I fully share."

The proceedings of the convention were also special in a way.

The late Mr. H. G. Shepard, the father of wood bending with brains, as one might say, a man of great originality of thought, made his last appearance. His personality was a very honored one in our trade.

Another epoch making discourse was that read by Mr. W. B. Templeton, the then publisher of The Hub. It was a paper on the Horseless Vehicle, prepared by his editor, the late Mr. Fitzgerald.

Let us quote two sentences: "In all probability no invention or improvement has been sprung on the world, not even electricity, with a force equalling that which has worked up the present horseless vehicle newspaper craze." And "the vehicle must be the work of the carriage builder, the machinist making the motor." What a pity that such words were not given better heed. What a commentary on a lost opportunity!

The other event was the presence of a Mr. F. V. Adams, of the Chicago Times-Herald, before the convention to explain the objects of the motor car race and competition for money prizes that the journal was promoting. He said, in part, "We want to make a contrast showing the different motive powers. We have had, so far, 40 entries. There are now being manufactured about 125 motors, vehicles and motor cycles (Note: this was the origin of the name motorcycle), as we have designated them."

Mr. Adams stated that he had witnessed the test of an engine that had developed nearly seven horsepower with a 140-pound engine!

He desired to interest the carriage fraternity in the new "jabberwock," and how well he accomplished his mission the following 20 years have demonstrated!

Ah well, the old times are always the good times. nevertheless it is certainly curious to note how that Cleveland conven-

tion 20 years ago has been a mile stone, marking so many changes in manners as well as in men.

Now just a paragraph or two of personal recollection.

The writer will never forget the violent rage of President Britton, as he burst into the committee room one morning, exclaiming he was going to leave the dash-dashed hotel at once, and he had ordered his "man" to pack and send his belongings to the Stillman up on Euclid avenue. It seems at breakfast that he had ordered a partridge and they had tried to work off a squab on this gourmet as well as gourmand. There was a scene in the breakfast room in a minute, and Mr. Britton's voice left no one in doubt as to what he thought of the head waiter, the hotel, the manager, as well as his state of mind that drew him toward punching the life out of the head waiter. If his six feet two had ever got in motion the waiter would have thought it must be that seven h.p. motor weighing 141 tons that Mr. Adams told about!

The upshot of it was that a bevy of the really choice spirits pulled up stakes, migrated to the Stillman, and the times they had there were worth remembering, as one may judge when such prime good fellows as Frank Hooker, Millard Lane, Britton and a few more put the ball in motion. I wish it were proper to lapse into an anecdotal frame of mind anent some of those proceedings. Their relation would be worth while.

Now, what of Cleveland, 1915, twenty years after?

Again Mr. McGrath is on the job, but, oh my, so different. The fund for entertainment will be the modest one that has been in effect for several years, with a rebate attachment to the donors, because we are so sedate we really cannot avail of the generosity in full.

And mirabile dictu! there will be ladies at the banquet from start to finish as was inaugurated at Atlantic City last year through the earnest propaganda of that knight of the Round Table, Homer McDaniels; also a Cleveland idea by a Cleveland man. The members will note the fact that the vehicle trade is divided into two parts, motor and horse, not the fact but 20 years ago, and the horse, while perhaps going strong, is going somewhat slow. The attendance is reported as going to be large, but the exhibits will be somewhat smaller in volume than in previous years, though larger than was the case the last time in the city by the lake.

The secretary "expects this to be one of the very best of our conventions," and as the honored secretary is the connecting link between the old and the new order, probably his judgment is the result of his ripe experience. Let us hope so.

And now the great question to be put 20 years after:

Will Cleveland again make history, and point the new departure to all that is good and to be wished for?

What About the Buggy, Anyhow?

There is such an unnecessary tendency to tune up and wail in a minor key by so many short range thinkers among those who build buggies and who supply a large quantity of the parts.

It has been not a good business year, but buggy makers are not suffering more than their share of the ills. But the tendency is ever to exaggerate hard luck. That it is forgotten when the sun of prosperity shines again seems to be beside the fact; just now the skies look dark, therefore the sun will not shine again. That is the business logic of more men than it would be supposed could be the fact.

The general condition of roads in this fair land are so consistently bad that for years yet the buggy with a horse to pull it out of mud holes will be a requisition always included in the bill of vehicular expense.

Of course the plum tree has dropped plums a plenty on the side of the motor car maker, but it has two or more sides, and the buggy men are not starving for fruit.

A comparison of misery sometimes leads to consolations. The motor makers, when engaged in the business of passenger vehicles exclusively, and having no war orders for trucks, have had one rotten business year, and we have heard no denials of

the fact from sources that were honest. So this medicine is as unpleasant as that held to the lips of the buggy maker—and their idle overhead mounts higher in expense.

It is fashionable to point to and at the one conspicuous exception, whose tinware almost seems to be all-pervasive, but think of the time when Lou Cook rose above the business horizon with the prototype of the "cheap Cincinnati buggy," and the same kind of chatter can be called to mind. But he simply led the way to the wonderful low-priced buggy of today, while the old generation couldn't find words of scorn enough in all the vocabularies to express their opinion or to conceal envy. It is thus progress progresses!

The cake today is divided. All admit a patent fact, but not all get a right view of the proportions of the division, because the hypnotism of big figures expressed in terms of dollars draw the mind from a fair, dispassionate view of a situation that is not at all bad for the buggy man. Until this brain storm wears itself out, it is probably of little avail to breast it.

But give us a year or two of real, pervasive, everybody-prosperity, and we will go to convention with songs that no swan will compose for us!

Changing Conditions

While the 1915 convention of the C. B. N. A. is reviving memories of trade conditions of twenty years ago, when the association gathered in Cleveland on a similar occasion, there is also present in various sections an undercurrent of anticipation as to the future of the carriage and wagon building industry.

If one were to take a snapshot view of the trade as it is today, he would observe many changes. He would find new firms, composed of men formerly prominent among the carriage builders, now engaged in the manufacture of automobiles. In some cases these same men have still retained their interest in the former line and continue the manufacture of horse-drawn vehicles, but as a separate proposition. In other cases there would be found new factories, new firms and new products.

The change from carriage to motor car production has been fairly general, though buggies to the number of nearly a million were reported sold during the past year, against, one might say, the production of some seven hundred thousand automobiles.

There are as many, if not more, horses in the country today than a year ago. With it all we feel that there is much demanding the consideration of this forty-third convention and no doubt by far the most interesting and important session will be that of Wednesday, when the subject of conditions in the trade today and plans for the future welfare of the industry will be the topic for discussion.

The Technical School

This year the instructor, Prof. Andrew F. Johnson, reports that the Technical School for Carriage Draftsmen and Mechanics graduated the largest class of students since the organization of the school in 1880. It is gratifying to learn of the continued success of this school, conducted under the auspices of the Carriage Builders' National Association. We are sure we express the feeling of the trade in general, when we wish the school and its able instructor continued success and further achievements.

To Sell Electrics Minus Power Plant

Elsewhere in this issue will be found an article dealing with the subject of electric vehicles. It brings out points of interest which will no doubt play an important part in the popularity of this type of vehicle, both pleasure and commercial, if the plans now being made are carried out successfully. It is a recognized fact that the electric vehicle is of particular value

in the congested transportation centers, and with this fact in consideration there will very likely be many sections to take up the plan proposed, which embodies a system of battery rentals. As vehicles can then be sold at a reduced price, minus the power unit, there will no doubt be an increase of sales of the various types that will be heartily welcomed by the builders. If the plans proposed are carried out the result will be a strong factor in the production of a standardized design, something hitherto difficult of accomplishment.

ANNUAL MEETING OF THE C. H. A. T.

To Be Held in Conjunction With the C. B. N. A. Convention,
Cleveland, O., September 20-24

Plans are practically completed for the annual meeting of The Carriage, Harness and Accessory Traveling Salesmen's Association, which will be held at Cleveland, O., September 20-24, at the Hollenden Hotel.

Secretary Jesse L. Nelson has sent out the following notice to all members:

The twenty-fifth annual convention of our association will be held at Cleveland, O., September 20-24, in conjunction with the Carriage Builders' National Association convention.

The annual meeting will be held at Hollenden Hotel, Tuesday evening, September 21, at 8 o'clock.

Wednesday evening, September 22, will, as usual, be known as C. H. A. T. night. This year it will be a chicken waffle dinner at the Hollenden, with music, vaudeville, etc.

Your directors aim to make this, our "twenty-fifth anniversary year," a most successful one, and ask the co-operation of each and every member to this end.

The circular reproduced herewith is also of interest to the traveling men:

Are you a C. H. A. T.?

What is the C. H. A. T.? It is an association composed solely of commercial travelers selling carriages, harness and accessory goods of these lines, and those connected with the trade journals.

Its object—to increase acquaintance and good fellowship by bringing men of a common interest together; to assist salesmen to positions; to aid employers in securing good salesmen.

Will you join us? Membership fee only \$1, which includes dues for the ensuing year.

Twenty-fifth annual convention at the Central Armory, Cleveland, O., September 20-24, 1915. Annual meeting Tuesday evening, September 21, at 8 o'clock, Hollenden Hotel; everybody welcome.

Chicken waffle dinner, Wednesday evening at 6:30 o'clock, Hollenden Hotel, for ladies and gentlemen; tickets, \$2 per plate; prominent speakers, vaudeville, good music.

For membership or tickets for dinner apply to Jesse L. Nelson, secretary, at The Spokesman booth, or from members.

Join us in membership and dinner.

Following is menu of the chicken waffle dinner:

MENU

Hors D'Oeuvres			
Celery	Olives	Radishes	Sugar Beets
Potage			
Mulligatawny a l'Indienne			
Entree			
Plain Fried (Fresh Killed) Chicken, Virginia			
New England Waffles			
Corn au Paprika			
Sweet Potatoes Glace			
Salade			
Romain, Combination			
Entremets			
Peach Parfait			
Fricandises			
Demi Tasse			

PROGRAM OF THE FORTY-THIRD ANNUAL MEETING OF THE C. B. N. A.

Tuesday, September 21, 10 a. m.

It is the desire of the president and the association that the proceedings shall open promptly at the hour named.

And to this session all the ladies visiting the convention are most cordially invited.

The meeting will be called to order by the president, Charles O. Wrenn, Norfolk, Va.

Address of welcome, by the Hon. Newton D. Baker, Mayor of Cleveland.

Response on behalf of the association by Thomas M. Sechler, Moline, Ill.

Opening address by the president, Charles O. Wrenn, Norfolk, Va.

Address by Adrian D. Joyce, Cleveland, O., on "Modern Business Tendencies."

Report of the Vehicle Trade Press Committee. A. M. Ware, Philadelphia, chairman.

Nomination of president for the ensuing year.

Appointment of Committee on Resolutions.

Appointment of a committee to recommend officers for the ensuing year.

Appointment of a committee on the exhibition.

Appointment of an obituary committee.

Adjournment.

On this Tuesday evening, September 21, the reception and entertainment to the members and their families will be held at the Hollenden Hotel. All members and their families attending the convention are invited to be present. Tickets for this occasion will be furnished free to members and their families.

Wednesday, September 22, 10 a. m.

Meeting will be called to order by the president, Charles O. Wrenn, Norfolk, Va.

Address by G. Arthur Bell, of the Bureau of Animal Industry, Washington, D. C., on "The Horse Industry."

Report of the Committee on Dealers' Associations. H. B. Staver, chairman.

Report of the Committee on a Standard Buggy. W. A. Sayers, chairman.

A general conversation by the members on the business situation, in which all members and visitors are invited to take part.

Report of Executive Committee. Charles A. Lancaster, South Bend, Ind., chairman.

Report of the secretary and treasurer.

Report of the Committee to Recommend Officers for the ensuing year.

Election of president.

Adjournment.

Thursday, September 23, 10 a. m.

Meeting will be called to order by the president, Charles O. Wrenn, Norfolk, Va.

Address by Grant Wright, Philadelphia, "The Value of Trade Journals to the Carriage Industry."

Report of the Committee on Statistics. O. B. Bannister, Muncie, Ind., chairman.

Report of the Trustees of the Technical School. Daniel T. Wilson, New York, chairman.

Report of the Committee on Freight and Classification. Theo. Luth, Cincinnati, O., chairman.

Report of the Committee on Abuses in the Carriage Trades. Perrin P. Hunter, Cincinnati, O., chairman.

Report of the Committee on New Members. Charles C. Hull, Connersville, Ind., chairman.

Consideration of the report of the executive committee.

Unfinished business.

New business.

Election of officers.

Report of Committee on Resolutions.

Report of Committee on Exhibition.

Report of the Obituary Committee.

Selection of the place for the next convention.

Adjournment.

The attention of members is particularly called to the importance of these meetings, especially to the one on Wednesday, when it is the desire of the association to have every one present take a part. No limit to the number of times any one may speak. The idea is to get information from all on the present condition of the carriage trade and to discuss ways to aid in its future success.

Both the business meetings and the exhibition will be held at the Central Armory, Cleveland.

The Banquet

The annual banquet will be held Thursday, September 23, at 7 o'clock in the evening at the Hollenden Hotel. Tickets for the banquet can be obtained from the secretary at Cleveland.

At the annual convention, held in New York, October 9, 1907, a resolution was passed "that the secretary be required to charge for all extra tickets the cost of the same per plate." As this banquet will cost \$5 for each person, the extra tickets will be \$5 per ticket.

This does not concern the members' own tickets, as they are all entitled to one ticket free. Only applies to the extra tickets any one may wish to have. Please note this so there will be no misunderstanding.

For the accommodation of the members of the association, the secretary will be at the exhibition hall on the afternoons of Tuesday, Wednesday and Thursday, September 21, 22 and 23, from 2 until 5 o'clock, for the reception of new members, giving out banquet tickets, and such other business as may be required of him. The members are earnestly requested to procure their banquet tickets as early as possible, so that we can tell how many will be present at the dinner.

To prevent mistakes and misunderstandings, the executive committee has adopted the following rule: Members of the association who desire their representatives to use their banquet tickets must give an order for the same in writing to the secretary.

MAY REPRODUCE MEDALS AWARDED AT 'FRISCO EXPOSITION

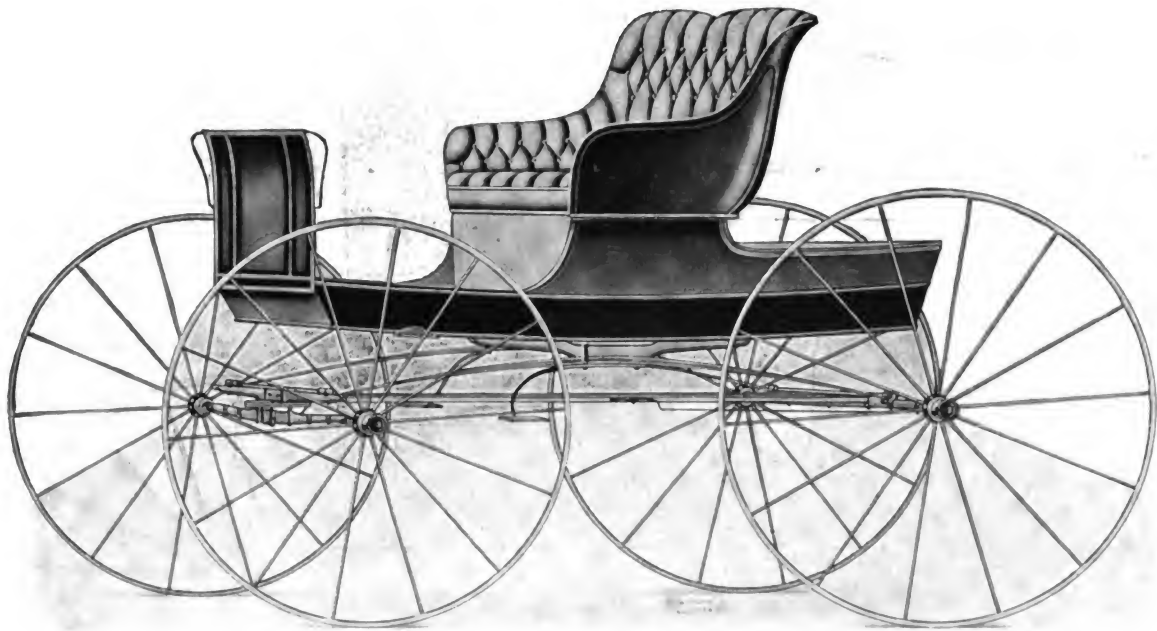
Some time ago the director of the mint ruled that without an act of Congress authorizing it, winners of prizes at the Panama-Pacific exposition could not lawfully reproduce the medals awarded them for advertising purposes. The ruling was based upon the fact that the medals were struck at the U. S. mint and it is not lawful to reproduce in any way the products of that institution.

Now comes the solicitor of the Treasury Department with the opinion that there will be nothing unlawful in the reproduction of medals to advertise the goods for which they were awarded. This official says that the law was designed to protect winners of medals from fraudulent imitations. He says the reproductions may be used by the exhibitors to whom the medals were awarded.

INSTRUCTIVE BOOK ON ROAD CONSTRUCTION AND MAINTENANCE

Those interested in the subject of good roads and the benefits resulting from proper care and maintenance of the public highways, will find much of interest and value along these lines in the new booklet just issued by the E. I. du Pont de Nemours Powder Co., Wilmington, Del.

Among the subjects which receive special attention in this booklet is that of efficient drainage, which is of vital importance to the permanency of road construction work. The inferior methods of drainage are all explained in a concise manner and the booklet is profuse with illustrations throughout. Copies of this booklet will be mailed free to those who mention *The Hub* when writing for same.



ROAD WAGON

Built by
D. M. SECHLER IMPLEMENT AND CARRIAGE CO.
Moline, Ill.



CONCORD BUGGY

Built by
D. M. SECHLER IMPLEMENT AND CARRIAGE CO.
Moline, Ill.



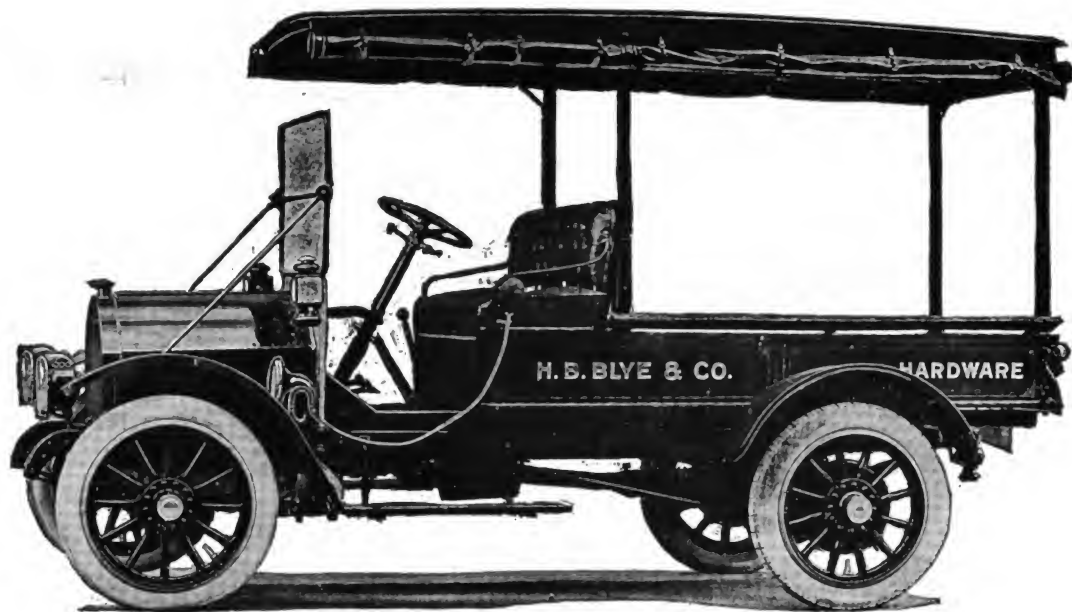
BANNER SIDE SPRING CORNING BUGGY

Built by
LUTH CARRIAGE CO.
 Cincinnati, O.



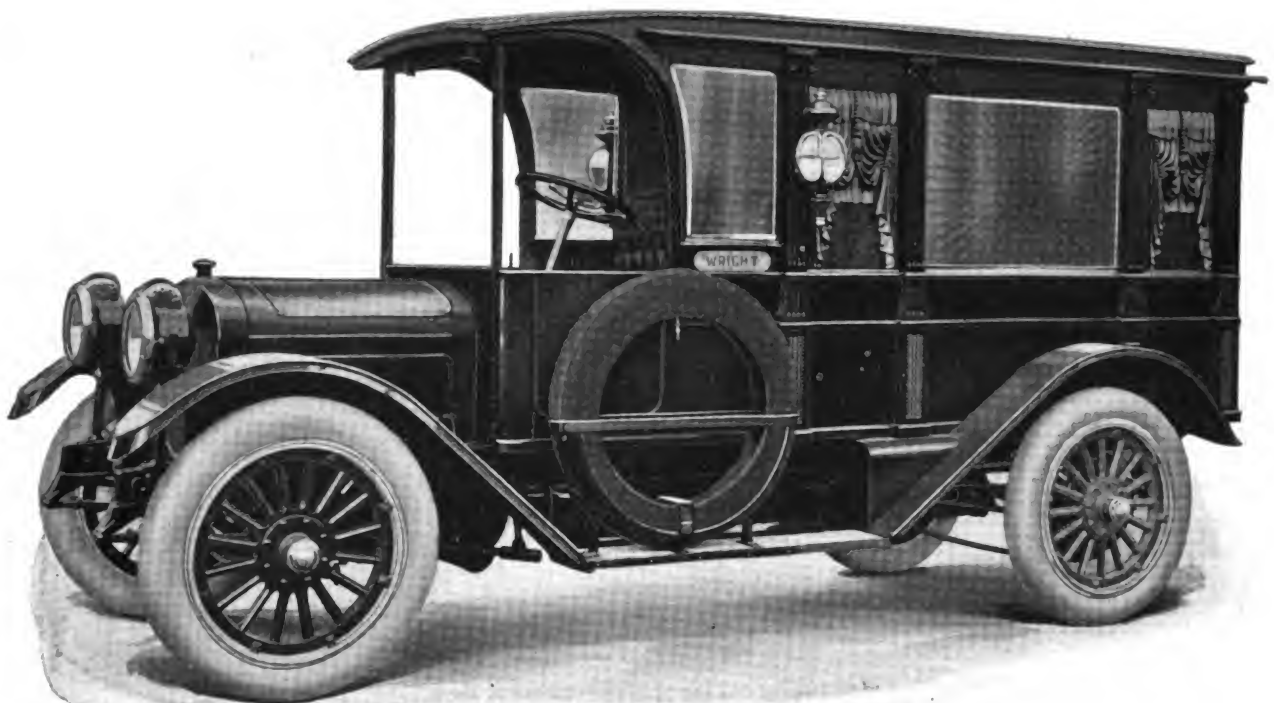
No. 83 BUGGY, AUTO SEAT

Built by
MIFFLINBURG BUGGY CO.
 Mifflinburg, Pa.



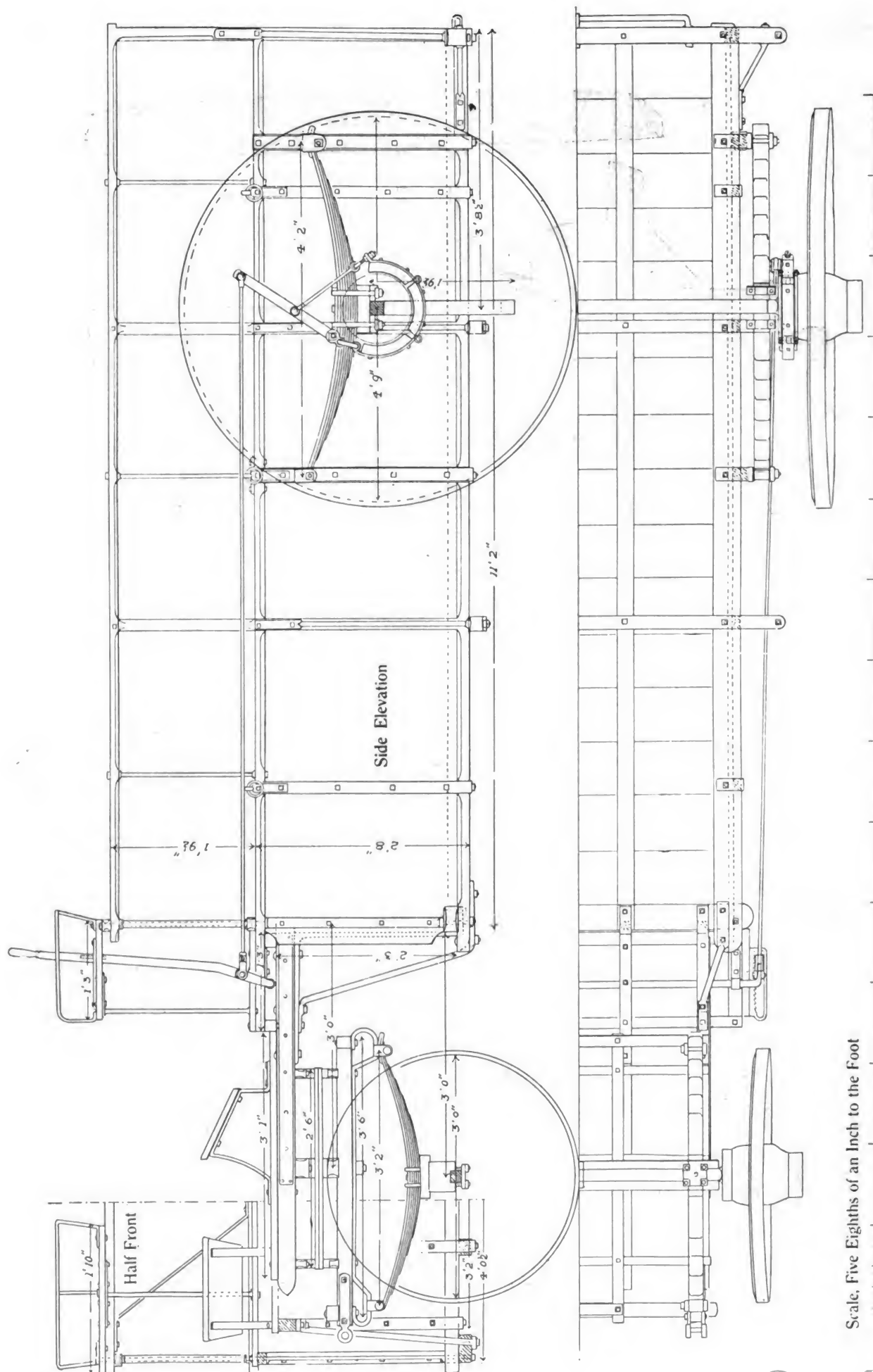
HOWARD LIGHT DELIVERY CAR

Built by
HOWARD MOTOR TRUCK CO.
Boston, Mass.



AUTOMOBILE HEARSE

Built by
BROCKWAY MOTOR TRUCK CO.
Cortland, N. Y.



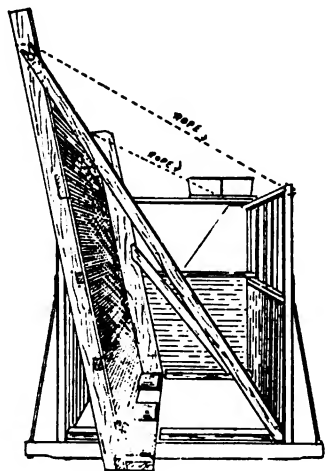
TRANSPORTING PLATE GLASS

Working Drawings of Float Built by Stickland & Sons, of Melbourne, Australia

These working drawings are taken from a float used by Brooks, Robinson & Co., Melbourne, and built for them by Stickland & Sons of the same city. Similar vans are in use at Melbourne and other centers, but in most cases they are heavier in construction. As it is principally used for the delivery of loose sheets from the glass warehouse the load to be carried is not in proportion to the size of the body; accordingly excessive weight is not called for.

After providing for the necessary body space, in this case 11 ft. by 3 ft. 9 in. clear inside, the main point, to facilitate loading and unloading, is to get the floor as near the ground as possible, under frame to ground being in this case 16 in. The forecarriage is in front of the body, the wheels being of a narrower track and placed far enough forward to allow for a full lock.

The body bottom frame is got out of 4 x 2 in., being dressed to 3¾ x 1¾. The middle rail is 1½ x 1¾ and the top rail 1¼ x 1¾. Back corner pillar is 1¾ square, and the two others are got out from same size, the lower half being reduced to allow for the ¾ in. panel which is fitted inside framing. A half round strap bolt takes the place of a wood pillar at the front corner, the top portion being rounded to go through a piece of ½ in. piping between top and middle rails. The four front rockers or body loops are 4 ft. 4 in. long by 2¾ x 1¾ in., butting on to the front panel. They are strengthened by four corner plates 1¾ x ½ in. thickness, made very strong at the corners and turned at the bottom to a right angle to take a bolt through the bottom frame. In addition there are two 7/8 in. round iron stays set on the angle as shown. The fore-carriage is the regular platform pattern measuring 42 x 36 in. over bars, the four bars being 1¾ x 2¾ in. The axle bed is 4½ in. wide by 4 in. deep with a 1¾ in. block between it and the spring. It may be used for pole or shafts, the size of shafts being 2¾ x 1¾ in., length 8 ft. 3 in. over all, including the two cross bars which are about 10½

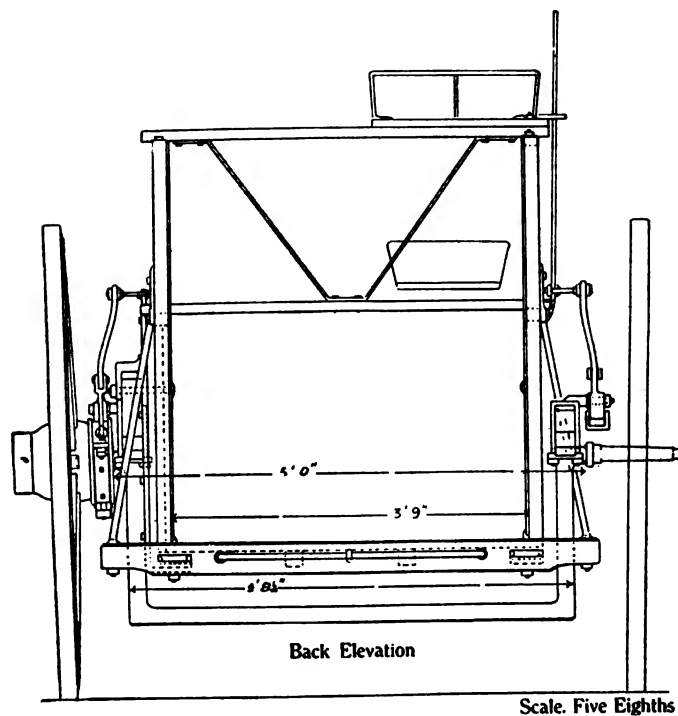


Movable frame for holding sheets of plate glass

in. apart. The middle rail of body extends over the front 15 in. and is covered with a decking 1 in. in thickness. There is also a decking of same size across rockers in front of this, forming a platform. Driver's seat rests on front cross rail of body with one 5/8 in. iron post supporting the front. The hind springs are hung in irons 1¾ x ½ in. in the body, but made much heavier at the jaws which require to be substantial forgings. A little extra weight here is a good fault. The bottom ends are turned in to take one bolt through bottom side, but they do not go across. Between these irons and the body there are fill up pieces of hardwood 2 in. square. There are two body cross bars

with stays, in addition to the back bar. These are necessary to stiffen the body against pressure from inside. The brake is attached to the hubs of both hind wheels, and is operated by either a foot piece or hand lever with ratchet from the driver's seat.

The outfit includes a wooden ramp 40 in. wide and 9 ft. long, consisting of two pieces of 3 x 2 hardwood with 1 in. boards across top and with two irons to hook over the rail on outside



of back cross bar. There is also the frame to carry the sheets of glass. This is made of Oregon or similar light timber measuring 8 ft. 6 in. in height and 12 ft. in length. It is made with a bottom piece measuring 6 x 2, with five longitudinal bars and three or four uprights. The framing is covered on the inside with ½ in. lining boards which in turn are canvas covered. This frame should lean to the near side rail, not the off side, as in the latter case the crown of the road might counterbalance the angle of the frame and cause disaster to the glass. Portion of the weight is taken by the other side by means of the ropes shown in dotted lines in the accompanying sketch. The frame is held in its proper place on the bottom of the van by means of two wooden chocks at each end. It is usual for two or three men to ride in the van to steady the load. The diagonal stays shown in the sketch are removable to facilitate taking out and putting in the sheets of glass which are made to rest on three pads. The hind springs are 2½ in. wide 8 plates, ¾ in. and 5/16, and measuring 52 in. over centers. Front spring is 2¼ in. wide 5 plates ¼ in. thickness and 38 in. long over centers. Axles are, hind 2 in. and front 1¾ in. Other measurements are set out on the drawing.

TRAILERS FOR AMBULANCES

Instead of continuing to convert passenger automobiles into ambulances, as in the beginning of the war, the British military authorities now use almost exclusively trailers, which are attached to the touring cars by means of ordinary drawbars. An anchorage for such trailers is attached to every touring car in military service, at very small expense, so that any one of the cars can instantly pick up an ambulance and convey it to the hospital at the rear. The trailer has been of great service to the hospital corps and is now manufactured in quantity by the inventor. The first car of this type was made in November last, and thoroughly tested before being submitted to the War Office.

A MANUFACTURING PLANT GENERAL STORE*

The Cleveland Hardware Company's Effort to Reduce Its Employees' Living Cost—Full Line of Household Goods Carried

By F. L. Prentiss

The ability of a workman to live comfortably and to provide for his family properly in these days of high prices depends to a larger extent than ever before on the practicing of domestic economies that will make a dollar go as far as possible. Shop employees, as a rule, are not in a position to purchase household provisions at an advantage but buy in small lots and frequently at prices that are high, considering the quality of the goods. For the purpose of improving the welfare of their workmen by making the dollars they earn more valuable, quite a number of manufacturers in the past year have established stores in connection with their plants. These stores, conducted along the line of practical co-operation, have, as a rule, proved successful from the viewpoint of the management, and have the hearty support of the employees as is shown by their patronage.

One of the larger companies that has recently established plant stores is the Cleveland Hardware Co., Cleveland, O., which opened stores at each of its two plants last November. While the bulk of the company's shop employees are of foreign birth and have been somewhat slow to take advantage of the saving made possible by patronizing the stores, the business has developed satisfactorily, growing from week to week, and sales have now reached \$2,000 per month.

In establishing the stores the company aimed particularly to aid two classes of its employees, the improvident and the provident. In the former class are those who through bad management of their domestic finances or by spending their earnings for drink, have little or nothing left soon after receiving their wages so that the strictest economy must be practiced until the next pay day, and, as a result, their families are often deprived of the bare necessities of life, and many fall in the clutches of loan sharks or contract other indebtedness that causes the tying up of their wages. Through the stores the improvident men are extended credit and are able to secure the necessary household supplies without compelling their families to go hungry until the next pay day. The other class particularly benefited by the

stores are the provident employees who want to make a dollar go as far as possible by buying as cheaply as possible.

In conducting the store the buying power of the company is utilized for the benefit of the employees and as this buying power is very large as compared with that of the average small retail merchant and goods are bought in large quantities, bottom prices are secured. In selling there is no necessity for adding to the margin of profit to make up for the losses sustained by merchants who do a credit business, as the payment for goods bought at the company's store is assured. Goods are sold to employees at about 10 per cent. above the cost price, this margin being sufficient to cover the expense of operating the stores. The selling prices are said to average from 25 to 30 per cent. below the usual store prices, but in the case of some goods the saving reaches 50 per cent.

Method of Conducting Stores

The method of conducting the stores is very simple. The employees are furnished with coupon books containing tickets amounting to from \$1.50 to \$5, the individual tickets ranging from 1c to 30c. When an employee makes a purchase he turns in tickets for the required amount or, if he prefers, he pays cash. The coupon books are charged against the employee and the amount is deducted from his wages at the next pay day. The stores are under the management of the assistant auditor of the company, who also acts as buyer. The sales are in charge of two clerks at one store and of one clerk at the other store. In connection with the stores are the factory supply stock rooms from which each department draws its supplies, for which an invoice is rendered to the department each month.

The stores are conveniently located on the first floor with outside entrances as well as entrances from the factory so that wives or children of the employees can make purchases during the daytime, the workmen themselves doing their buying outside of working hours. The line of goods sold is very complete. There is kept in stock a full line of staple groceries, ham, bacon, butter and eggs, bakery goods, candies, tobacco, cigars, garden tools, overalls, gloves, neckwear, hose and shoes for both men and women, and various other articles. Milk in pint bottles is peddled throughout the plant twice a day by messenger boys. The bakery is very liberally patronized by employees during the noon hour. A laundry agency is also maintained. In addition to the goods kept in stock, sales of various other goods such as stoves and furniture are made through wholesale houses by

*By courtesy of The Iron Age.



One of the plant stores of the Cleveland Hardware Company showing the wide variety of articles carried

catalog or by sample. By an agreement with a wholesale house an employe can go to the wholesale dealer and secure furniture at a large saving in cost. A similar arrangement for the purchase of men's clothing has been made with a tailor. The factory stock room, which occupies a section of the same floor, is patronized quite freely by the employes. In this department they are able to buy paints, wire, screws and various other products at less than store prices.

A PROPERTY STATEMENT

Reasons Why It Should Be Required by Traveler and Given by Dealers

The National Implement and Vehicle Association has just published two neat little folders entitled "Twenty Reasons Why Salesmen Should Obtain and Dealers Give Property Statements." The folders are printed in two sizes, one which contains 20 reasons and one which contains 10 reasons, for distribution among the dealers only. The 20 reason circular follows:

Because business today, with its keen competition, close prices and small margins of profit, requires every safeguard to prevent loss. The property statement shows the character of the risk and what protection, if any, is necessary.

Because your house needs your best judgment and efforts in all its work, including the obtaining of property statements and credit information. The value of your services is judged largely by safe sales and co-operation in credit matters.

Because if you were selling your own goods you would insist on knowing that the buyer can pay for them; the best way to know this is through his property statement.

Because no dealer should expect to buy goods on credit, unless he shows ability to pay for them. He can have no good business reason for refusing to show the condition of his affairs when expecting credit.

Because if you take the time and go to the expense of soliciting and writing a contract you should support your judgment, and confidence in ability of purchaser to pay, by securing his property statement.

Because the property statement supported by your personal credit report forms our best information and will save delay in acceptance of order.

Because if by a property statement any part of the business is shown to be out of proportion, it can perhaps be corrected, or a possible loss avoided. This will tend to reduce credit risks and make business safer.

Because in many cases you can aid the dealer in properly making up his statement. Such help will increase confidence and make him feel more friendly toward you.

Because the very act of filling out a uniform property statement blank will give the dealer a better insight to the condition of his business.

Because dealers' and manufacturers' associations have endorsed the uniform property statement and its use is general.

Because business is largely done on credit. Confidence and the property statement form the basis of credit and are therefore business necessities. The property statement increases confidence which when established is a valuable resource.

Because property statements are required and given more and more each year. The government demands them in connection with loans made through the Federal Reserve banks.

Because the general use of property statements tends to make better trade conditions, eliminates the unworthy and unfair, reduces losses and insures reasonable profits.

Because it is fair and right that the one extending credit should have direct and first-hand information concerning the affairs of him to whom credit is granted.

Because information must be had. Direct property statements prevent injustice through reports from outside sources, which may at times be unfriendly and do harm.

Because you should know more about your business than

anyone else, consequently can do yourself justice by giving the facts. Such statements are treated in strict confidence.

Because you should not sell goods on credit or loan money without security unless you know of ability of debtor to pay. The uniform property statement is the best form in which to show ability to meet obligations.

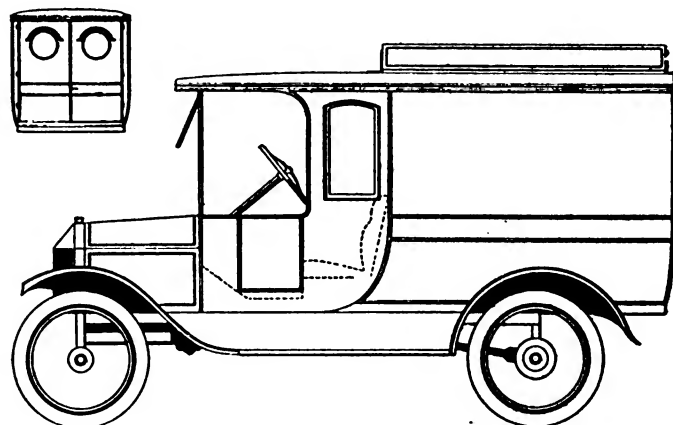
Because your creditors are partners in your business to the extent of credit granted, and as such are entitled to know the condition of your affairs.

Because while past experience is an indication, it is not conclusive evidence of present condition. Possible changes make it advisable to maintain confidence by giving creditors property statement each year when you take inventory.

Because in times of business stringency, or unfavorable local conditions, favors are more freely granted and help more readily given if you show by your property statement how you stand.

FORD GENERAL DELIVERY BODY DESIGN

The wagon design shown in the illustration is a delivery body mounted on a Ford chassis. This style of body makes a very attractive outfit and can be used in mostly any line of business where the load is not too great. The body measurements are as follows: Length, 5 feet back of the driver's seat; width,



Ford Delivery Body

4 feet 4 inches; height, 4 feet 1 inch. The body is built with a cab in front for the protection of the driver, which also adds to the general appearance of the car. At the rear of the car are two rear doors opening at the center, as shown in the miniature rear view in the left hand corner. The doors have a round window in each to give light inside. The front of the body is open back of the driver in order to assist in the deliveries.

On the roof of the body is a sign board to be used as a means of advertising, or for the name of the firm using it. The board is 5 feet long and 7 inches high. Blacksmith and Wheelwright.

REHKOPFS MOVE INTO NEW QUARTERS

A fine new three-story building, located at 212-214 W. Sixth avenue, Topeka, Kas., is the new home of the well known Rehkopf firm, builders of carriages, buggies, motor trucks, and automobile bodies, auto tops, etc. Five brothers constitute this enterprising concern: Edward L., Lou N., Ben W., Fred A., and Barry W. Rehkopf.

The new building is in itself a worthy architectural, as well as a welcome industrial addition to Topeka's business district. Two industries carried forward in the Rehkopf plant which should receive commendable mention are the manufacture of the Hayden TieTong used by railroads throughout the country and the Hayden automatic garden rake, which is machined and assembled at the Rehkopf institution.

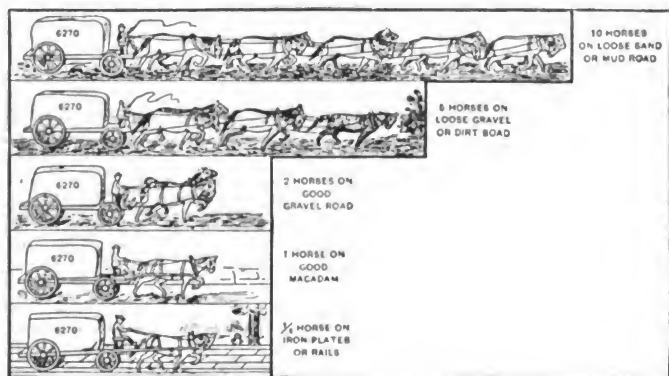
GOOD ROADS AND THEIR VALUE TO THE FARMER

A discussion of the problem of good roads written from the point of view of the farmer, which should be very effective in removing the opposition to permanent road construction which farmers in many sections manifest, has been written by S. M. Williams, sales manager of the Garford Motor Truck Co., of Lima, O.

Mr. Williams has specialized in the sale of motor trucks for good road purposes for several years and he has made a close study of the road problem in all its phases. Recently he traveled with a truck, a tent and a moving picture machine throughout the southwest, lecturing on good roads and their benefit on community life. His trip resulted in a great deal of new construction in the large territory which he covered.

He has found that many farmers are opposed to expenditures for good roads because they regard highways as luxuries required only for the accommodation of city automobilists. In his pamphlet, just published by the Garford company, he has hit on the strongest arguments with which this prejudice may be overcome by appealing to the business sense of the rural residents. He shows also the value of good roads in the country to city communities.

He says: "The urban population complains of the high cost of produce. The farmer complains of the high cost of marketing the products. Much of this is due to bad road conditions. Those in the towns and cities say, 'We should not be required to build roads for the farmer,' and the farmer continues to be



Graphic illustration of the haulage capacity of animals on differing highway surfaces with a load of a given weight

satisfied with his bad roads, resulting in low efficiency in earning ability and rapid depreciation of his teams. In such communities both the urban and rural population are paying many times the cost of road improvements without securing them."

In one county in Tennessee, the writer points out, one bale of cotton was the average load for a team before the improvement of roads began. There are now 100 miles of improved road in that county, and 12 bales is not an uncommon load, increasing the earning ability of the farmers' team 12 times. Some time ago the farmers were notified by telephone of a sudden rise of \$4 a bale in the price of cotton. The farmer living upon the bad roads, who could haul only one bale, got a profit of only \$4 a load extra. The one living on the good road got an extra profit of \$48 on each load. And he hauled the load the same distance in the same time without injury to his team.

In another Tennessee county the cost of delivering wheat from the farm to the railroad, a distance of 10 miles, was reduced for one farmer from 15 cents to four cents by road improvement.

Some astounding figures on the increase in volume and value of produce as the result of good roads are quoted. One county in the south spent \$100,000 in five years building good roads and two years after the first roads were laid the volume of

freight hauled over them had gone up 45 per cent. Dairy and poultry products showed an increase of 145 per cent. Figuring the decreased cost of hauling on the larger volume of tonnage a yearly profit to the farmers of \$41,000 on the \$100,000 invested in good roads was shown. On one stretch where the road cost \$28,000 the yearly decrease in hauling cost amounted to \$14,000, or 50 per cent.

Market prices for farm produce vary considerably during a year. With bad roads farmers are forced to move their crops to market not when prices are most favorable, but when the roads are passable, thereby losing large opportunities for profit. The United States Department of Agriculture figures that the farmers are losing \$250,000,000 a year through their inability to get their products to market at advantageous times, owing to bad road conditions.

Several years ago the price of potatoes in a certain town was \$1.40 per bushel. Surrounding farmers had large quantities of potatoes, but could not get them to market over their roads, and several carloads were shipped in by railroad before the demand was satisfied.

As soon as good roads are built in any community land values at once increase. In one county in Alabama good roads increased the value of land from an original price range of from \$6 to \$15 to \$25 per acre. The United States department of public roads cites the case of a 100-acre farm in Virginia for which the owner could not get \$1,800. He fought road improvement, but it went through in spite of him. A little later he refused \$3,000 for the farm. Another farm on the same road was supposed to have been sold for \$6,000. The purchaser broke the bargain, and then after the roads had been improved bought up the same property for \$9,000.

A certain state which has only four per cent. of permanently improved roads has one of the best systems of dirt roads in the country. They are kept up by the farmers, who drag them constantly, and the nature of the soil helps to keep them in good condition. The state engineering department estimates that it costs the farmers of that state \$11,000,000 annually to move their product to market over the roads. Fully 75 per cent. of the traffic is carried on 10 per cent. of the roads. A permanent surface on those roads would reduce the cost of hauling about 33 per cent. If 10 per cent. of the roads in the state were permanently improved it would mean a saving of from \$3,000,000 to \$3,500,000 for the farmers, which would go a long way toward paying for road improvement.

Mr. Williams presents the graphic diagram given herewith, showing the horsepower required to move 6,270 pounds over various road surfaces. In soft sand or mud ten horses are required; on loose gravel or dirt, five horses; on good gravel, two horses; on good macadam, one horse; on iron plates or rails, half a horse.

Taking up the social benefits of good roads, Mr. Williams shows that they mean good graded schools, and an active and healthy community social life. Bad roads mean isolation, loneliness, lack of mental development, poor schools, and even insanity, as shown by the studies of various sociological bodies. —Motor Truck.

STUDEBAKER TO BUILD IN CANADA FOR FOREIGN TRADE

The Studebaker Corporation announces that it will build all its cars for the foreign market in its Canadian factory in Walkerville. Heretofore Studebaker cars for the foreign trade have been built in Detroit, but an investigation proved that this branch of the business could be carried on much more economically and efficiently from Canada, and as a result, the output of the Studebaker factory in Walkerville will be multiplied several times. Work has started on fitting up the Canadian plant to meet the increased demand, and in a short time upward of 500 men will be employed, new traveling cranes and air compressors installed, rubbing decks and finishing rooms built and railroad sidings rearranged and increased.

THIS AUTO IS A FLAT ON TIRES

Motor-driven Gypsy Van With Kitchen, Running Water, Beds, Tables, and Even a Roof Garden

If the well known Haroun-al-Raschid, Commander of the Faithful, had ordered the most powerful Jinns acknowledging fealty to him to produce out of thin air for his royal pleasure a vehicle which should have the power of motion and yet be a dwelling place fit for a Caliph, the result would have fallen far short of the actual house upon wheels which left New York recently for a trip to the Pacific coast.

This unique motor vehicle, which he calls a "gypsy van," is owned by Roland R. Conklin, of New York and Huntington, L. I. He is making the transcontinental tour with his family. With more sense of space in many ways, although much smaller actual dimensions than the private railroad car, this sublimated English caravan, land yacht, or what you will, has all the conveniences of a country house, plus the advantages of unrestricted mobility and independence of schedule.

Mr. Conklin decided last spring to visit the Panama-Pacific Exposition, and conceived the idea of making the trip in an automobile which would provide living as well as traveling facilities. The result is the present vehicle, which has been constructed under his direction in New York. Instead of being obliged to lay up in a smoky railroad terminal, it can pitch camp by some wooded stream or lush pasture. It need follow no time tables nor stick to any track.

It embodies an extension to the field of recreation of the time-honored principle of carrying one's office under one's hat.

Regardless of the fact that this novel transport is not striving to maintain a schedule, people at various towns along the route traveled have expressed resentment at the belated arrival of the "Gypsy." Industrious reporters have evidently overlooked the fact that Mr. Conklin is traveling for his own pleasure and has no desire to make any record runs during his transcontinental trip.

As speed was not a special object, a comparatively small motor of 60 horsepower could be used, specially geared for power on grades. Canvas strips for sandy sections, a knock-down, portable bridge and a winch operated by the motor, strong enough to pull the car out of a mudhole or ditch are special items of equipment. No such vehicle had ever been attempted before on this scale but his experience in designing large vehicles for traffic, as the president of the New York Motor Bus Co., convinced Mr. Conklin that his idea was practical, so he went ahead. The result has been the production of a unique unit of travel.

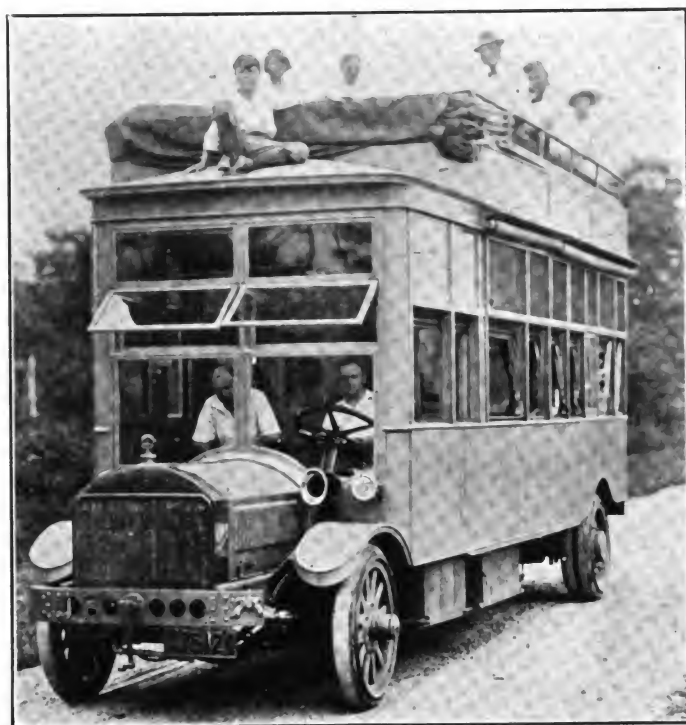
The body of this land yacht is mounted on a truck chassis, of the motor omnibus type, with such changes and additions as were necessary to meet the varied calls upon it. The inside dimensions of the body are 21 feet in length, 7½ feet wide and 6½ feet high. On top there is a full-sized deck, fitted with a big folding leather top and side curtains. The body has 44 windows, fitted with glass sash, shades, and copper wire screens. Screen doors are provided in addition to the regular doors at both entrances.

Probably the best way in which to get a clear idea of all the wonders of this unique vehicle is to enter at its main door, which is at the back, and go right through the "house" from cellar to garret. As you approach the car from the back you see a wooden door, but no steps, unless you happen to recognize the folding steps of a pattern similar to that used on some of the New York surface cars. When you turn the doorknob and open the door these steps unfold easily. When you have mounted and opened the screen door you find yourself in the rear compartment, which probably combines more different functions with less waste of space than any yacht or launch cabin in existence.

At your left as you enter is a roomy icebox with several compartments and a hundred-pound ice capacity. In one side of this a folding metal wash bowl not unlike those in the wash-

room of a railroad parlor car, is concealed. A little pull brings this basin down into its position for use. It is fed from the large water tanks on the roof. Above this basin is a water filter for drinking water, one coil of which passes through the icebox, so that chilled water of filtered quality is constantly on tap. Next to the icebox toward the front of the car is a neat porcelain kitchen sink, and near it is an electric range with several burners and a large oven. A miniature dresser with spices, sugar, flour, and the like is on the wall, and other cunningly contrived cupboards and racks hold pots and pans and a plentiful supply of cutlery.

From the ceiling above this part of the compartment a rack hangs which holds the folding dining room table. This is used in the main compartment of the vehicle, and measures eight feet by two feet when set up. Immediately over the door through which you entered there is something more which at once arrests your attention in an inspection of the ceiling. This is the spray head and curtain ring of a shower bath. The first thought that enters your head is in query form. Where does the waste water go when the shower is in use? At first glance it looks



The "Gypsy Van" under way

as if a bath would be followed by a flooded kitchen. But not at all; this contingency has been provided for in the same ingenious way with which other difficulties have been met in the "Gypsy."

By raising a little sunken latch in the floor a section of the flooring comes out, disclosing what looks like a small trap door divided into four sections. When these in turn are lifted by their latches they are found to be lined with metal and to form a sort of box, the sides of which are several inches above the floor level and the bottom several inches below that level. With the final touch of a rubber stopper the shower bath arrangements are complete.

The shower bath is about in the center of the car's rear compartment. That is to say, it is midway between the wheels, but near the entrance door. Nearer the front of the vehicle on the right side of the compartment is a folding short step ladder to be used to reach the companionway which leads to the upper deck or roof. This step ladder leads a double life, however. It unfolds into a card table with a special, non-slipping surface. Below the companionway is wainscoting which conceals a deep cupboard with shelves. In this are quite a library of books, a stock of playing cards, films and other small articles.

Next it, toward the front, one of the sunken latches of which there are so many in the car, is an invitation to prying fingers. Operated, it reveals one of the neatest examples of space saving in the whole structure—a writing desk which apparently unfolds out of nowhere and contains all the fittings of the ordinary library *escretoire*.

After absorbing the wonders of the rear compartment, or sublimated galley, writing room, shower bath and wash room, according as the mood or the time of day governs its function, the visitor aboard the "land cruiser" is ready to go forward, into the central and largest cabin. This has a triple function; it is living room, dining room, and bedroom and most attractive it is for any of these purposes.

The furniture is covered with attractive material, and there is a sort of valance to match above the windows, which make up the side walls of the compartment. All the windows, by the way, open in the same way that house windows open. They are provided with green shades, not unlike those used in a parlor car and have wire screens on the outside. In addition there are awning strips and frames on the outside of the car which can be let down to keep out sunlight or light rain at night.

The interior woodwork of the compartment is of ash finished in a light neutral tone of pleasing effect. The ceiling, which at



An attractive "room" in the Conklin auto

first glance appears to be solid, is finished in the same way. As a matter of fact this ceiling contains four berths or bunks which fit into an almost inconceivably small space when not in use, but pull down quite easily and look like decidedly comfortable beds. They are of the same size as the lower berths or couches; that is to say, several inches larger in each dimension than the standard railroad sleeping car berth.

Above each of the couches one of these berths is located, the other two, both disappearing, being a little further forward and set across the vehicle. There is, therefore ample sleeping room for six persons in this compartment. Each of the berths is provided with side curtains hung from brass rods, which give complete privacy, and each has a very flexible wire spring and a thick hair mattress. But their comfort does not stop with mere bedding. A clever way has been found to provide bureau and wardrobe space for each bunk.

At the head of each of the upper berths, as they may be called for convenience, in the partition between the central and rear compartments of the car, is a closet of the "scientific management" variety. When you open its door you see first a little recess, and forming the back of this space, as it were, several drawers with the familiar socket latches. When these are opened they are found to be deeper and more commodious than appear-

ances would indicate. There is lots of room for one's linen, cravats and small articles. In the space or recess between the door and these drawers there is a hanger, and there is just enough room to hang a suit neatly with the trousers folded once over a bar.

The lighting arrangement is such that each bunk has an electric bulb at its head, so that if it is one's custom to turn the pages of a book while awaiting the coming of Morpheus, the habit need not be laid down simply because one is doing motor touring *de luxe* instead of spending the nights in more usual habitations.

When you emerge on the upper deck you find it guarded by a wire mesh rail which can be folded inward to give less overall height to the vehicle. Around the sides are broad lockers with seat cushions on top, which form delightful seats through the medium of adjustable back racks. These lockers contain guns, fishing tackle, and a commissary supply sufficient for two weeks. They also conceal tanks for hot and cold water, several folding chairs and divans, with mattresses, for outdoor sleeping. Clothing can also be stored in them in a special case made to measure, half way between a suit case and steamer trunk. By means of the seat cushions and sort of folding Morris chair in the center, five persons can easily ride abreast on the upper deck, all facing forward.

The land yacht is not without its tender. Like the tender of any sea-going craft, this has its abiding place on the upper deck and is lowered away by means of davits, which are concealed from view when not in use. Here the analogy between sea and land stops, however. The tender in this case is a motor cycle, which is carried on its side in a compartment on the rear of the roof. When it is desired to scout ahead in order to make a first hand survey of the road conditions test a bridge or measure a place where the headroom is believed to be scanty, all that is necessary is to unship the motorcycle and send the chauffeur off on a tour of inspection. By the same means fresh supplies of light weight may be secured, letters sent to any desired point, and a dozen other "chores" be performed swiftly.

The great size of the "Gypsy" necessitated special study in the matter of color. The exterior is in great part veneered with wood, a soft tan shade having been chosen to bring out the grain of the ash. The chassis is a quiet gray green. This combination gives the vehicle a sort of protective coloration, as the ornithologists say, blending with the landscape, as the main portion is in harmony with the road itself and the balance harmonizes with the grass. All the interior fittings follow the note of the faun gray walls. The upholstery and valences are of gray Spanish linen, with a design in the mellow greens, blues, and reds of old tapestry. The silk curtains also help to preserve the restful effect of the interior. Even after a dusty day's run the car should look fresh and inviting within. Here, as in other features of the vehicle, the practical has not been forgotten for a moment.

One of the most interesting features of this remarkable car is its easy arrangements for converting it into a veritable camp when the owner wants to stop for the night or for fishing or shooting. This is done by raising the top and side curtains for the upper deck and letting out awnings against either side, which when lowered protect the main body from sun and light rains without the closing of windows. This upper deck is also made mosquito proof. When stopping for camp a flag waves at the head and a powerful searchlight can rotate in every direction. The electrical equipment includes two fans, a drill, emery wheel, soldering iron, etc.

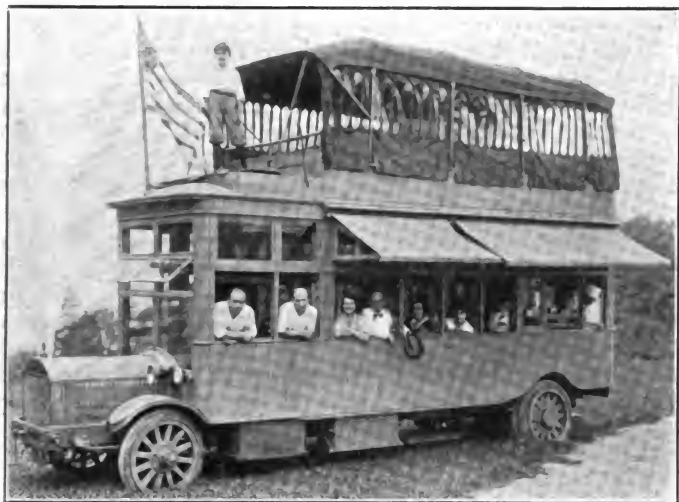
The weight of the vehicle, with its complement of passengers, crew, and provisions, is a little less than that of a Fifth avenue motor bus, with its passengers. The wheelbase is 206 inches, but the overhang in the rear is only 46 inches, measured from the rear axle center. A six-cylinder gasoline motor, with cylinders $4\frac{1}{4} \times 5$ inches, is used. The height from ground is 11.6 inches and the minimum clearance 16 inches.

The transmission is of the selective sliding dog type, with gears always in mesh. It is really a double-gear box, as it gives

nine speeds forward and three in reverse. This unusual transmission was necessary because of the special requirements of this vehicle. It must be able to travel faster on good roads than the ordinary motor truck of similar weight, and must also be able to negotiate far steeper grades and deep sand.

The gear ratio on the lowest forward speed is $86\frac{2}{3}$ to 1, as compared with 26 to 1 on a Fifth avenue motor bus. The gear ratio of the highest speed is $8\frac{2}{3}$ to 1. Final drive is through worm gears. Solid tires 5 x 36 inches, dual on the rear, are fitted.

A pump, driven by gears from the shaft, is provided for filling the water tanks on the roof. It will lift water from a depth 15 feet below its level. A winch, similarly driven, is attachable to the front of the frame. A $7\frac{1}{2}$ kilowatt generator, driven from the gasoline motor, and a 30-cell battery giving 225 A. H. at 36 volts, supplies electricity for cooking, vacuum cleaners, and auxiliary lighting. A separate generator is used for starting the gasoline motor and for lighting. Very easy riding is secured through the employment of semi-elliptic springs, four inches



The "Gypsy Van" showing its roof garden

wide and 56 inches long, specially constructed. The brakes are very powerful, the service brake acting on the rear wheel, having 260 square inches of braking surface.

Before starting on its transcontinental trip, this motor land yacht was driven several hundred miles over the hills of New Jersey and Westchester county and through the sands of eastern Long Island. No attempt at a speed record will be made in crossing the continent, and Mr. Conklin plans to make a number of side trips en route to interesting places. He will follow the Lincoln Highway in the main.

Latest reports from the "Gypsy Van" are from Ohio. So far the travelers have enjoyed a highly satisfactory trip and have experienced no serious mishaps.

WHAT A BUGGY MAN SAW AT A PICNIC

A few days ago I was invited to attend a farmers' picnic, held a few miles from a town where I had a pretty good customer, that is, he had been a good customer in days gone by, before the advent of the Ford and automobile, writes "Observer," in Implement Dealers' Bulletin. My customer was one of the many who had contracted a very bad case of "cold feet" in regard to the future of the buggy business and who would not listen to my arguments and entreaties. I did not feel that I could spare any time to attend farmers' picnics, but the suggestion of fried chicken, sweet corn, sweet milk, cream and all, was too much for me for I had been out over a month partaking of all kinds of hotel fare. I accepted the invitation and went with my customer in his little old auto to the picnic. Well, such a sight as was spread before my eyes. I forgot all about

the buggy business for the time being and sailed into that fried chicken, etc., etc.

When I had satisfied the inner man and had visited with the farmers' wives and children in the true politician's style, I set out to ascertain about how many buggies and automobiles were on the picnic grounds. To make my story as short as possible, I will say that of course I found a great number of automobiles, but I found more buggies. There were a few carriages. I then determined that I would find out how many new buggies, those bought this year, were on the grounds, and by actual count there were 29. I then hunted up my customer and together we made the rounds again to ascertain if possible who sold these buggies.

To my chagrin we found that out of the 29 buggies, 17 bore name plates which showed that they had been bought from some mail order house. By this time I was ready to go back to town for I was not in a good humor. I told my customer what I thought of the business ability of a bunch of dealers that would let the buggy business get away from them in that way. He admitted the mistake they were making, bought four buggies from me, asked my advice about an advertising campaign and said he would get busy. The result of this object lesson was, that today, just three weeks from the date of the picnic, I received a letter from my customer, saying that three of the buggies were sold and that he wanted more.

Now, this condition prevails in many places. The dealers are at fault. They have just simply laid down on their buggy business, whereas, if they had kept up their advertising and had worked the trade right they could hold much of the business that is now getting away. I may have some more experiences to report later.

N. I. V. A. CONVENTION

This year has been a strange and complex one in a business way and nearly every one is at least thinking the question, "What of the future?"

The executives of the National Implement and Vehicle Association are planning a program of information, and already the interest in this convention is manifest by the number of hotel reservations made, which number over 80 rooms, about equally divided between active and associate members, which is many more than in any previous year at this time.

The reading of committee reports, customary in former years, will be superseded by printed reports arranged for ready reference.

Each session will be presided over by a sub-chairman who has prepared his subject for discussion in a most attractive way. Many of the most important problems of the manufacture and sale of farm operating equipment will be dealt with in an expert way.

Among the matters to be presented are the following:

Manufacturing costs, by an expert in our lines.

The Retail Dealer, by a member of the Federation.

Sales problems, by members of our Sales Managers' Department.

Standardization, by some who have succeeded in doing it.

This is only a sample of this "worth while" program. No one seeking more light can afford to remain away and each member should see to it that as many department heads as possible attend.

We urge that the matter of hotel reservations be given early attention, especially for the benefit of the ladies who accompany our members. Convention will be held in Indianapolis, October 20, 21 and 22.

National Implement and Vehicle Association,
By E. W. McCULLOUGH,
Secretary and General Manager.

THERMOID RUBBER CO. ADDS

The Thermoid Rubber Co., Trenton, N. J., will build a two-story, 71 x 190 ft. addition to its plant.

NEW AMERICAN MILITARY TRUCK

Jeffery Machine Drives, Steers and Brakes on Four Wheels

Practically, the first Balkan war saw the earliest serious attempts to use motor trucks in actual warfare. Experience in this war developed the following requirements: Good ground clearance; attachments in front and rear for towing; sprags to hold the vehicle on steep, slippery grades; quickly applied non-skid chains.

Experience in the present war indicates the desirability of four-speed transmission, a differential lock, a relatively small high-speed motor, a large and easily filled gasoline tank, interchangeable carburetor and magneto, drain cocks on the radiator and on the water jacket of the motor, etc.

The British government refuses motor trucks with double side-chain drive and requires interchangeability and standardized control, together with uniform construction on fuel tank, radiator, starting crank, brake connections, speed control, engine timing, draft hooks, etc.

On the western front in Europe there are two phases of motor truck transportation: That over good roads up to within a few miles of the firing line; and that on bad roads in the territory traversed by the opposing armies, rutted by vehicles and possibly damaged by artillery fire, this phase including some traffic across fields. It is this last phase of work which is particularly hard on motor trucks.

A type of motor truck peculiarly fitted to the operating conditions which arise in military service has been developed by the Thomas B. Jeffery Mfg. Co. It is unusual in that all four wheels are used for driving, steering and braking. The improvement in traction, using a four-wheel drive, is well known. With power applied on all four wheels the truck can climb grades and pull through mud, sand, or snow which would stall an ordinary two-wheel-drive machine. Braking is more efficient and prompt, and by means of the front and rear-wheel steering, the truck can turn in half the distance ordinarily required.

The drive involves automatic locking differentials one in the front power axle and one in the rear, having irreversible spiral gears. The effect is to put the available power into any wheel or wheels which can get traction when the others cannot. None of the road wheels can lag in speed behind the motor. In turning, the two outermost wheels can overrun the others, but as soon as any wheel tends to lag the differential locks and renders the driving shaft virtually solid from wheel to wheel. If one wheel loses traction the other on that axle takes all the power previously shared between the two, and if the motor has the power at all the vehicle will be dragged out of the hole.

The motor, situated partly under the floor boards and partly under the hood in front of the driver to the right, drives through a dry-disk clutch and a longitudinal shaft to a four-speed transmission at about the middle of the chassis. This transmission is of the selective type with the forward-speed gears constantly in mesh. Speed changing is effected by dog clutches. A broad silent chain drives from the intermediate spindle of the transmission to a shaft through the transmission. At each end of this shaft is connected a propeller shaft with universal joints at each end, which drives the power axle through a pair of bevel gears and the differential already mentioned. Each differential casing is bolted firmly to its respective dead axle, the weight of the vehicle being carried on these dead axles, and not at all by the power axles.

The power axles, which emerge from each end of the differential, connect through a ball-and-socket joint with pinions which mesh with internal gears fixed firmly in openings on the inside faces of the road wheels. The ball-and-socket joint permits turning the wheel at an angle to its axle. The brake drum is cast integrally with the all-steel wheel and forms an extension of the opening which contains the internal gear; the brake is of the internal-expanding type, easily adjustable without removing the wheel.

The ground clearance of the truck is unusually large.

One of the essential points in the truck design is the high degree to which interchangeability of parts is carried. It may be broadly said that, except for the transmission, the controls and the motor with its adjuncts, the truck is the same front and rear. The four wheels are exactly alike; only one size of tire is used; the two differentials are interchangeable; driving shafts, power axles, and dead axles are duplicates; brakes and brake rods are the same front and rear; steering connections are the same for front wheels and for rear wheels; the four main springs and the four auxiliary volute springs are the same. Standardized details have been used throughout the machine wherever possible.

The advantages of this are obvious. The operation of the truck is easier to learn, and the truck is easier to keep in adjustment and repair, while fewer spares are required and consequently less equipment needs to be carried in the field, a point of great military importance.

Practically every important adjustment can be met without disassembling. Simplicity of operation has been kept always in mind. As a result of standardization and interchangeability rapid manufacturing has been possible.

Double-end control is obtained by rigging a steering gear at the rear end and interconnecting it with the front, the rear end being provided also with clutch and brake pedals, although it depends on the front end for control of the motor. The electric starting and lighting equipment is supplemented with a hand-cranking device which can be operated by the driver without his leaving his seat.

The manufacturer of military trucks does not usually furnish the bodies. These are built by the governments interested. This truck is suitable for carrying a variety of bodies. Among these may be mentioned armored bodies with machine-gun turrets; the flexible operation of the truck makes it particularly suitable for the service this body implies. With four speeds forward and four reverse it can run up to the enemy's trench and retreat without turning around. If necessary, however it can turn in a circle from 38 to 50 feet in diameter.

Another interesting type of body is a traveling wireless station involving a sectional mast 80 feet high to support the antennas; this is raised by a tripod on the back of the truck. The most common body, however, is that of the United States army escort wagon, having flare-board sides and a tarpaulin-covered bow top.—Jerry W. DeCou, in *Engineering Magazine*.

C. A. WILLEY COMPANY IN NEW QUARTERS

During the past few months the new buildings of the C. A. Willey Co., New York, manufacturers of automobile and carriage paints and varnishes, have been completed and occupied by this firm.

The main, or paint and color factory, covers a space about 75 x 200 feet and is six stories in height with basement. This building is of reinforced concrete and affords ample space for the manufacturing requirements, as well as sufficient space to take care of a very large increase of business in this line. All equipment is of the very latest, modern type.

The varnish works is located on the same plot of ground as the paint factory and is also a thoroughly modern plant in every particular.

A new, modern power plant, located in a detached portion of the main factory buildings, is so equipped as to make the whole plant independent of central station power service. This is an important feature, as in the case of failure of the central station service, power is generated to operate the works, and thus any loss of time resulting from mishap to the central station is guarded against and delays in filling orders avoided. The company's line is known as "Willey's Superfine Specialties" and users may be assured of products of a high order of excellence emanating from a plant equipped to supply the most exacting demand.

MODERN CONVENIENCES FOR STORING THE TOURISTS' NEEDS

When the first automobile tourist filled his tanks, cranked up and started on a journey fraught with more or less excitement, he experienced no particular problem in disposing of the equipment, the edibles and what-nots that then and now are a penance and a pleasure. In the first place, he had not a great deal in the way of equipment, and in the second place, the appearance of his car on the road could create no more comment if loaded down with boxes, baskets, and carryalls than if it had none of these homely conveniences. The early tourists made no bones about appearance. One box, more or less, strapped to a running board or to the back of the tonneau, made no difference to the peace of mind of the owner.

But automobiles and the persons they carry have changed somewhat since those early days. The modern creation, to find favor in the eyes of a purchaser, must be long and lean and sleek and smooth. In short, it must be a finished creation in the fullest sense of the word; make-shifts have no place in its



Stowage compartments in closed cars generally are a problem; in this car, the basket slides down into a compartment behind one of the seats.

makeup. There must be a place for everything, which it is the duty of the manufacturer to produce, and everything must be in its place, which is the duty of the owner.

It is a fact worthy of note and comment that though the modern car is carrying a great deal more equipment than did any of its illustrious predecessors and there is a great deal more room for the disposal of the things the tourist considers necessary, there is less in the appearance of the cars now to indicate this than ever before; and what is of greater importance, it seems likely that though the cars that are to come next year and the year after will provide carrying space for still more of what may be termed luxuries, there will be still less indication of their increase in capacity.

Now, the most natural question in the world is, Why? Why can the modern car be made such a carry-all without in the least destroying its lines? Why are there no bulbous protuberances? Where have the designers put all the things that once were in more or less plain view?

The answer to the first question is to be found solely in the



Most bodies are mere shells. This is an example of how a thinking designer has made use of what otherwise would be waste space.

skill of the designers. In a way they may be accused of taking a leaf or two from the books of their French cousins, for assuredly the French—and other European designers, be it added—are past masters in the art of providing almost extraordinary carrying capacity for freight other than passengers, and concealing it in the most ingenious manner.

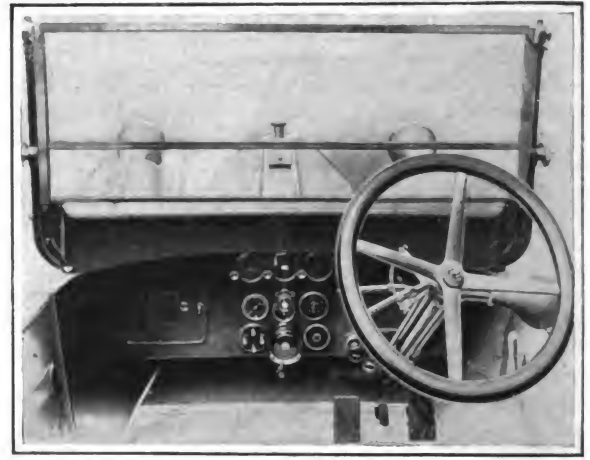
Though the modern motor car has proceeded along scientific lines and its development has come slowly in the light of past experience, it would seem that there is at least one feature of



Here is an example of how a manufacturer has made use of space that otherwise would be wasted; a tool locker under the floor.



Large compartments at the back of the front seats serve to house the auxiliary chairs when they are not in use.



Small cupboards in the deep cowl serve as convenient receptacles for goggles, gloves and the like.

design that has not been given all the attention that it warrants; and, in the same breath, it would seem that this feature now is being given more attention than ever before.

That feature is the careful utilization of waste space. To the average owner who knows not a great deal about the actual construction of his car, it may appear that there is not a great deal of room that has not been put to some useful purpose. But in the majority of cases that is not so. There are a dozen places where improvement might be made. There are corners and cubby holes all over a modern car that might be made of service to the car owner.

To this fact the designers are now waking up. There has been no increase in the external dimensions of cars; rather they seem to be getting slightly smaller, if anything. Yet the amount of space allotted the passengers is increasing. Nor has weight increased. Practically everyone knows that the car of 1915 is considerably lighter than the car of 1914. The movement has been all toward a reduction of weight coupled with an increase in capacity.

So, in a way, the designers have been forced to an ultimate utilization of every possible bit of waste space. The long running boards which are such a prominent feature of long wheel-base cars may be looked upon as waste space, but the dictates of fashion prohibit the placing of anything on them. Even the spare tire now has been relegated to a place of comparative obscurity at the rear of the tonneau. Nothing has remained but for designers to find a place actually within the body of the car for the storage of such necessities as are not in reality a part of the car itself.

The placing of the gasoline tank at the rear with feed to the carbureter by the vacuum method, or by pressure, has released

the space under the front seats where the tank formerly rested. This provides a roomy compartment. But there is the accompanying disadvantage that access to this compartment necessitates the disturbance of two passengers. And it must be remembered that comfort is now more than ever the fetish of the modern designer.

It is all very well, says Stanley Petman, in *Scientific American*, to provide roomy compartments that are hard of access, and it is not altogether difficult. The problem is to provide such compartments in such places that they may be instantly accessible without the necessity of disturbing the passengers. And withal, these compartments must occupy some space that is not now put to some more useful purpose, such, for instance, as providing "stretching" room for the nether limbs of those who occupy the seats. No, we must not curtail the passenger room. What then?

There is, for example, the space beneath the flooring and between the chassis frame. This could hold a roomy receptacle which would be easily accessible simply by removing one floor board. In somewhat the same category there are the spaces between the running boards and the chassis frame on either side. They could be made into large compartments. Bodies in no case are solid; in the majority of cases they are mere shells of metal built on a wood or metal frame work. Then why not utilize this space for the stowage of small articles, such as goggles, gloves, route books, and so on?

In addition to these body spaces, we have the doors to which we can turn our attention. In a great many cases, manufacturers now fit commodious flap pockets on the doors, but still greater use could be made of them. Like the bodies, they are



When tools are placed in this locker they are instantly available without the need for disturbing the passengers.



Here are some clever compartments that occupy the space between the foundation of the body and the outer shell.



How waste space is utilized in a closed car. The compartment is large enough to house several bags in addition to spare tires, tools, etc.

largely mere shells. Why not a tool compartment in each door, with a place for each tool?

The large space underneath the deep cowls with which the modern car is fitted is a fertile field for exploration. Not all this room is required for the feet of the passengers. We have room here for several cupboards where the tourist might place such things as are in constant demand.

And now that the practice of placing seats in what military authorities would term echelon has become popular, there is a large space behind two of the seats that should not be permitted to go to waste. In some cases provision is made for carrying two suitcases in such compartments.

And, by the way, to revert to hollow shells of bodies, it is worthy of note that in several cases designers have provided for housing the top completely between the body and the framework, when the weather is fine. This surely is an advance that, augurs well for the future.

The space between the turtle-decks with which a great many roadsters are fitted is not generally permitted to go to waste. Generally, it is used to house spare tires. But it is not always as accessible as might be the case. Doors at the side aid materially in permitting easy access to the compartments, particu-



Route books, maps, touring data and other things that are wanted quickly fit nicely into these deep pockets.

larly when they are used for purposes other than the storage of tires, as so often is the case.

The space between the front seats and the division in the car that marks the tonneau from the driver's compartment is another place where there is room for an exercise of ingenuity on the part of designers. This space might be utilized for a couple of large compartments with doors opening into the tonneau. Yet few makers have made such use of it.

Not all the waste space in the modern car has been made use of as yet, though it may be expected that ere another year has rolled around there will be not as much as there is now. And these new compartments and storage space that are coming into vogue cannot be looked upon solely as "selling features." They mark a distinct advance in the science of motor car building—a fact which is being increasingly realized.

ELECTRIC VEHICLE ASSOCIATION CONVENTION

Program of the Coming Meeting at Cleveland, O., October 18 and 19

The plans for the sixth annual convention of the Electric Vehicle Association of America which will be held in the Hotel Statler, Cleveland, Monday and Tuesday, October 18 and 19, are rapidly nearing completion. There was held in Cleveland on Thursday, August 19, a meeting which was attended by Messrs. M. E. Turner, T. P. Cagwin, J. P. Lyons, representing Mr. M. R. Berry; H. N. Sibbald, M. H. Moffett, R. S. Dunning, secretary of the Cleveland section; G. E. Miller and A. Jackson Marshall.

Following are the convention committees:

General Convention Committee—Samuel Scovil, chairman; Mathias Turner, secretary; R. P. Anthony, Edward S. Babcox, M. R. Berry, T. P. Cagwin, Fred H. Caley, N. H. Boynton, R. S. Dunning, Hayden Eames, J. W. Frazer, H. B. Gay, H. S. Green, W. J. Hanley, George H. Jones, George H. Kelly, S. A. Leonard, James F. Lincoln, A. Jackson Marshall, G. E. Miller, M. H. Moffett, F. L. Morgan, Homer Niesz, S. V. Norton, James P. A. O'Connor, W. G. Rose, H. P. Secrest, H. N. Sibbald, M. S. Towson.

Transportation Committee—H. N. Sibbald, chairman; H. B. Gay, A. J. Mitchell, W. H. Link, George H. Watson.

Entertainment Committee—G. E. Miller, chairman; Fred H. Caley, R. S. Dunning, James P. A. O'Connor.

Finance Committee—M. H. Moffett, chairman; N. H. Boynton, George H. Kelly.

Publicity Committee—T. P. Cagwin, chairman; E. L. Colgrove, B. Dyer, A. C. Fash, W. G. Rose, Harry Smith.

Registration and Publicity Committee—A. Jackson Marshall, chairman.

Papers Committee—George H. Jones, chairman; W. J. McDowell, W. H. Onken, Jr., S. G. Thompson.

H. N. Sibbald, chairman of the transportation committee, is planning desirable transportation for convention delegates. Mr. Sibbald, who may be addressed, National Lamp Works of the General Electric Co., Nela Park, Cleveland, O., is very desirous of hearing from all those who are likely to attend the convention as there is a possibility that special trains might be secured from New York, Chicago, St. Louis and other points.

In recognition of the great and growing drain on business organizations of the "convention habit," the association has decided to reduce its forthcoming convention to the lowest possible terms so that executives and other busy men can gather its benefits with a minimum expenditure of time. To this end, the sessions will be run on efficiency lines and supplementary entertainments, such as form a conspicuous part of so many society gatherings, will be subordinated to business.

The transportation and entertainment committees contemplate providing transportation and guides for those delegates remaining over to Wednesday after the convention, which officially closes Tuesday night, so that they may visit the manufacturers' plants, show rooms, and points of interest in Cleveland.

Exhibition Committee

M. R. Berry, chairman of the exhibition committee, reported that there seems to be a strong demand for an exhibition of electric vehicle batteries, charging apparatus, measuring and registering instruments, tires, accessories, etc., and consequently tentative plans are under way to hold exceedingly interesting exhibitions at the Hotel Statler. It is expected that the exhibit will prove one of the most interesting features of the convention attracting a large number of delegates who otherwise might not attend. An opportunity will also be given the commercial, passenger, and industrial truck and electric wheel chair manufacturers to exhibit if they so desire.

Any concern or individual desiring space for exhibition purposes should communicate with Mr. M. R. Berry, Electric Products Co., 10674 Dupont avenue, Cleveland, O.

George H. Jones, chairman of the papers committee, was unable to be present. Secretary Marshall reported for Mr. Jones the following tentative and partial program developed to date:

"Industrial Trucks in the Service of the Pennsylvania Railway Co.," by T. V. Buckwolder, Pennsylvania Railway Co.

"The Electric Taxicab," by I. S. Scrimger, secretary and general manager, Detroit Taxicab & Transfer Co.

"The Hartford Electric Co.'s Experience With the Battery Maintenance and Battery Exchange System," by Samuel Ferguson, vice-president, Hartford Electric Light Co.

"The Function of the Electric Garage," by R. Macrae, of the Commonwealth Edison Co., of Chicago.

"Comparative Development of General Power and Commercial Electric Vehicle Loads and Function of Power Salesmen as Electric Vehicle Solicitors," by H. H. Holding, general car representative, and S. G. Thompson, general electric vehicle representative, Public Service Electric Co.

"Problems We Are Facing and How They May Be Met," by George H. Kelly, secretary Baker Rauch & Lang Co., and president Electric Automobile Manufacturers' Association.

"Field for the Small Electric Delivery Vehicle," by Charles A. Ward, secretary-treasurer Ward Motor Vehicle Co.

"Electric Vehicles in Municipal Service," by Arthur J. Slade, consulting engineer, New York City.

In addition, there will be reports from sections and association committees and there is excellent reason to believe that the papers program of the sixth annual convention will be a particularly bright spot in the association's history. There are many matters which will come up at the convention which will tend to exercise a very considerable influence on the future of the motor industry.

As has been previously stated, the headquarters for the October 18 and 19 convention will be the Hotel Statler, the room rates of which are \$2 per day upwards for room and bath for one person, and \$3 per day and upwards for room and bath for two persons; suites—parlor, bedroom and bath, \$10 and \$12.

The Hollenden Hotel rates per day with bath are as follows: For one person, \$2 to \$5; for two persons in one bed, \$3 to \$6; for two persons with twin beds, \$4 to \$6; and suites at various prices.

The aforementioned rates are based solely on the European plan. The Colonial Hotel has both European and American plans.

Mathias Turner, secretary of the General Convention Committee, of the Cleveland Electric Illuminating Co., Cleveland, O., or A. Jackson Marshall, secretary of the Electric Vehicle Association of America, 29 West 39th street, New York City, will be pleased to give or secure additional information with reference to hotel accommodations in Cleveland at the time of the convention.

It is suggested that each delegate make his own hotel reservations direct with the hotel which he selects and that reservations be made early in order that desired accommodations may be assured, as we expect a large convention attendance with corresponding demand on hotels.

Registration

In order that each delegate attending the convention may be properly taken care of, the request is made that those contemplating attendance at the convention so advise at their earliest possible convenience the general office of the association in New York, stating the expected time of their arrival at Cleveland and whether they will be accompanied by ladies or other guests.

The association is a clearing house for a great number of sales prospects secured not only from different points in the United States, but also practically all foreign countries. When inquiries for electric vehicle information or other sales data is requested, same is satisfied immediately through the medium of letters and literature, and the information contained in these inquiries are placed on what is termed "common" and "preferred" prospect sheets and immediately mailed out to all manufacturers of electric vehicles, batteries, tires, accessories, industrial trucks, etc., which organizations supply inquirers with detailed and specific sales data. It is interesting to note as a partial result of the association's extensive publicity campaigns conducted in many of the foreign countries that it is receiving a large number of excellent letters from almost all points in the world, seeking information about electric vehicles, and in many instances indicating a desire to purchase some type or model. This is interesting because to many people the Electric Vehicle Association is regarded solely as a national body whereas it is conducting quite an aggressive international campaign which is assisting the manufacturers in selling their commodities abroad. The association has quite a number of foreign members and these are being increased rapidly.

RUSSELL GARDNER TO PUT UP MILLION DOLLAR AUTO PLANT

An automobile company with a capital of about \$1,000,000, and headed by Russell E. Gardner, is to open a manufacturing plant in St. Louis this fall to engage in the manufacture of moderate price cars, such as are receiving a heavy sale throughout the middle west.

A party of New York bankers arrived in St. Louis, Saturday, September 4, to confer with Gardner about the opening of the factory.

A tentative location for the automobile factory is in part of the plant of the Banner Buggy Co. at Main and Rutger streets.

A definite project has not yet been decided upon, but it is likely that one or more of several St. Louis projects will be welded into a St. Louis automobile manufacturing company shortly after the conference with the New Yorkers, according to Gardner.

Small cars would be manufactured by the new company. It is Gardner's belief that St. Louis is a logical center for the manufacture of automobiles because of its nearness to the supply of products used in making such cars, its low cost of fuel and the large number of railroads which radiate from St. Louis into every part of the middle west and southwest.

REDUCTION IN WORKING HOURS

The Willys-Overland Co., Toledo, O., has announced a voluntary reduction in the working hours at its plant from 50 to 48 per week, effective November 1. No reduction in pay will be made. Time and one-half will be allowed for overtime and double time for Sundays and holidays. This follows a 5 per cent. increase in wages voluntarily granted six weeks ago.

HESS CARRIAGE CO. EXTENSION

The Hess Carriage Co., Kansas City, Mo., in the past few months becoming large manufacturers of automobile bodies, is erecting a two-story building 50 x 133 adjoining their present quarters, the steel being designed to carry five stories. The addition will cost \$25,000.

Paint Shop

INDEX HANDS

By W. K. Bryning

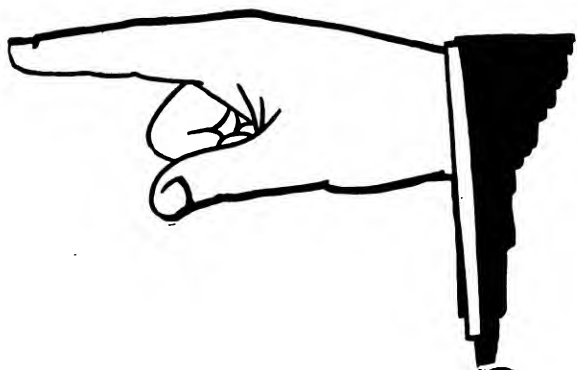
In applying the drawing and painting of index hands on signs by the signwriting as the means of attracting attention, a good taking advertisement can be given to the work, which usually leaves an impression of a lasting character to the passerby.

The form of a hand in any position painted on a sign arrests the onlooker's eye and causes more than ordinary interest.



Naturally his eye then travels from the hand to the signwriting alongside.

In the drawing of the index hand the sign writer carries his model with him, viz., his own hands. By arranging his left hand in position wanted, he is able with chalk to mark out the hand on the sign and straightaway paint it in. Or, better still, at home sit before a mirror and hold hand in position desired and draw as seen in the mirror. Some of the examples shown here were drawn in a similar manner as the hand was in too awkward a position to be drawn otherwise. Also by the aid of the mirror we can draw the hand in a greater variety of ways. By drawing from the glass the hand can be arranged so as to



get the best results from the shadows as it is by the shadows that the form is best expressed.

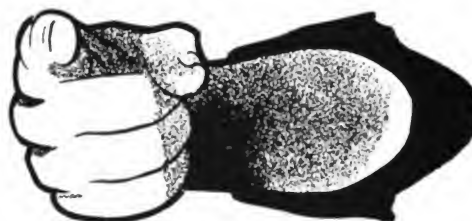
Better still, is to ask a friend to hold his hand in the position wanted, and then commence to draw, say, with lead pencil and paper, by this means, by having the drawing on paper, it can be transferred. What has been transferred may be pounced.

The original drawings should be kept, as then unlimited transfers can be made from them as pounces soon wear out.

In the drawing of the hand the aim should be in getting a firm, round point of the index finger, a decided showing of the

direction in which the onlooker's eye is to travel or the person to go.

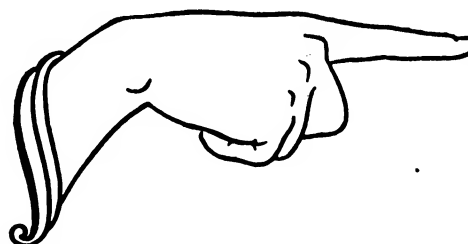
Drawing the end of the index finger with the tendency to point (conic shape) shows direction much sooner than if the



finger were of a square or spatulate shape. The conic index finger denotes a higher type of hand.

It has been noted of the index finger if conic, that the owner is generally a person given to thought and conception and a person of more intelligence than the owner of the spatulate or club-like type.

In the drawings of the hands on the sign showing direction to ladies' dressing rooms, or pointing in at a jeweler's window



or something similar we would, of course, paint in a light refined type of hand, but if the hand is to point to an iron monger's window or for use in street signs it would preferably be drawn in a stronger and heavier manner.

It is wise for the sign writer to think of these things as he is out to do the best work in the best manner and to work in a poor and unfitting index on a well written sign is like a beautiful face from which a couple of the front teeth are missing.—Australasian Coachbuilder and Wheelwright.

THE USE OF WHITE LEAD BY PAINTERS

The report of the Departmental Committee appointed by the British government in 1911 to investigate the danger attendant on the use of paints containing lead in the painting of buildings has just been issued. The recommendation of the committee is that at the expiration of three years the use of paints containing more than 5 per cent. of white lead be prohibited. This is signed by all the members of the committee excepting one, Mr. W. G. Sutherland, secretary of the National Association of Master House Painters and Decorators, who suggests that regulations for the use of lead paints should be made and that dry rubbing down which is acknowledged to be a source of danger should be strictly prohibited.

The allowance of 5 per cent. of lead in paints is made to cover lead colors, such as chromes, the small proportion of lead found in many driers and in some varieties of zinc oxide.

The report consists of 134 pages. The number of cases of lead poisoning reported among house painters in 1910 amounted

to 197. The largest number of cases reported being in London, Birmingham, Manchester, Bristol, and Leeds.

The committee met on 49 days and 118 witnesses were examined, of whom 93 were called by the committee. The committee included two members representing the journeymen, one master builder and one National Association of Master Painters. There was also a considerable amount of evidence from witnesses from foreign countries. Many of the master painters stated that rather than undergo the inconvenience to which they would be subjected if regulations were enforced they should prefer that lead be prohibited altogether.

The following may be taken as a fair synopsis of the report:

The committee early came to the conclusion that the large number of cases of white lead poisoning was to be greatly deplored and that something must be done to put a stop to it. Although the personal cleanliness of the workmen prevented lead poisoning to some extent it was shown on the other hand that dry rubbing down was very dangerous however careful a workman might be, while the splashing arising from stippling was also an item of importance. Dry lead paint on overalls was another considerable source of danger and periodical washings at intervals of at least a week was another point insisted upon. The question then arose as to whether a satisfactory substitute for white lead existed. After hearing evidence the conclusion was reached that zinc oxide and lithopone, if mixed with proper vehicles, proved quite satisfactory. It was also shown that the supply of these materials would be adequate for the purpose. The whole question then resolved itself into this: Whether it would be better to enforce the regulations or to prohibit the use of lead altogether, and the committee, as already stated, came to the conclusion that the latter course would be preferable. In arriving at this conclusion they were apparently influenced considerably by the expressions of opinions by leading master painters but principally upon the fact which was made quite clear, that if even such regulations were made they would be extremely difficult to enforce. An interval of three years before the recommendations are carried into effect was allowed in order to give an opportunity for existing stock to be used up and for decorators to become more familiar with the technique of applying zinc oxide and lithopone.

Mr. Sutherland gives a very lengthy report, in which he urges the following points among others:

It is established by evidence of the medical authorities who have been before the committee that the great source of danger resides in lead dust created by sandpapering and dry rubbing down.

Personal cleanliness is very desirable; the danger from this source is slight compared with the danger from the dust produced by dry rubbing down.

As to the alternatives to white lead, he states that zinc oxide and lithopone both need fortifying or strengthening for external work by special oils or varnishes and even then they do not give the permanence of lead, indeed, as to lithopone it is common ground among painters and paint makers that however useful for inside painting, for outside work it is unsuitable, and he states emphatically that white lead is the most useful, as it is the most permanent white pigment we possess for external painting, and its use does not involve the addition of varnish or special oils to give it stability for outside painting.

The total production of white lead in Great Britain he gives at about 50,000 tons per annum.

As to the proposed regulations, he states that the abandonment of dry rubbing down would remove at once the source of 90 per cent. of the trouble. He is convinced that if dry rubbing down were prohibited, and if necessary enforced by penalties the trade would observe the restrictions and find a substitute for it. The abolition of dry rubbing down is an inconvenience rather than an impossibility. If in addition to this prohibition facilities for washing were given, the danger would be reduced to a minimum. Speaking on behalf of the painting trade, Mr. Sutherland claims that master painters are as solicitous as any other body of employers to do what is possible for the welfare

of their men, and he feels assured that if regulations were passed they would willingly co-operate with the authorities to making them effective. He further suggests that the regulations should be given a trial for a period of five years from 1915 to 1919, and he further suggests that in the meantime a committee of investigation should be appointed, comprising representatives of the Royal Society of Arts, Royal Institute of British Architects, Society of Chemical Industry, the National Federation of Paint and Varnish Manufacturers, the National Association of Master House Painters, with an independent chairman to formulate a plan of operations for making exhaustive tests of white lead and zinc oxide paints under conditions which would be accepted as authoritative, and he considers that this would be very helpful in educating public opinion on this point.

Linseed Oil as a Primer for Metal

In order to prove the value of linseed oil as a primer for steel or iron as a protection against rust, the *Painters' Magazine* reproduces photographs of two wagons with steel bodies that for several years stood unprotected and exposed to the elements. The article goes on to say: The contrast between the state of preservation of these two wagons is so evident that it does not require microscopic examination to determine which is the best and as the difference is entirely due to the priming—or at least no other cause can be assigned to it—a very practical object lesson is afforded to the painter who is required to protect steel from rust. These two photographs come to us from W. E.

Gourne and Jacobs Mfg. Co.,

of Columbus.

One of the wagons shown was painted in April, 1902, 13 years ago, and has been out in the weather for seven years, day and night, with no shelter of any kind, during which time it has not been in use, because the old wagon equipment was replaced by auto trucks and the wagons were no longer needed. This wagon was painted as follows: The steel was thoroughly cleaned and followed with one coat of boiled linseed oil, with just a little drier. Two weeks were allowed for drying, and then the linseed oil priming was followed with one coat of half red lead and half white lead in oil, with a little turps and no drier. This was followed with a coat of green and then a coat of color and varnish. The wagon was then striped and lettered and given one heavy coat of gear varnish. Mr. Stickel had no body varnish at the time, and thought the gear varnish would answer, as he knew it to be a good grade.

The other wagon was painted exactly the same except that the priming of boiled linseed oil was omitted. This was painted in September, 1903, 17 months later than the other wagon. Both have been standing out exposed to the weather for the same length of time. The difference between the two wagons is very apparent. The one that was primed with linseed oil, although painted first, is in fairly good condition, while the one on which this linseed oil priming was omitted is almost all scaled off and rusting badly.

Mr. Stickel says: "In my experience of the past 40 years in painting steel, this is the best result I have as yet had. I think the best results could be obtained in painting steel passenger coaches for the railroads if they would give the steel one coat of oil and plenty of time to dry, or bake it on, and follow this with one coat of half red lead and half white lead in oil, with plenty of time to dry. If time cannot be allowed, baking the first two coats would give a good foundation to build upon."

THE CONSTITUTION OF CHINESE WOOD OIL VARNISHES

The modern varnish operator is well acquainted with the general characteristics of Chinese wood oil, particularly those developed during the heat treatment necessary to the manufacture of high-grade rosin varnishes. He is, however, sometimes puzzled to account for the irregularities exhibited by the different shipments of raw oil, with which he is supplied. There has always been considerable difficulty in determining whether the peculiarities of the particular oil in question are due to

unavoidable irregularities of the oil or to an adulteration that has not made itself manifest during the laboratory examination of the shipment.

The past difficulty in the detection of tung oil adulteration, writes E. E. Ware and C. L. Schumann, in the *Journal of Industrial and Engineering Chemistry*, is being overcome, due to the development of methods of examination that will detect comparatively small amounts of added material. The 1915 report of Committee D1, American Society for Testing Materials, will, no doubt, do much toward standardizing the analytical methods for this oil, and by so doing will be of considerable assistance to the varnish maker in the regulation of his product.

The most characteristic property exhibited by china-wood oil is its rapid bodying at temperatures considerably below those used for other oils. This increase in viscosity continues to the point of complete solidification, even at a temperature as low as 150 deg. C. The length of time necessary for complete solidification depends upon the temperature and ranges from 30 hours heating at 150 deg., to 10 minutes at 280 deg. This solid material, particularly when formed at high temperatures, is a non-tacky, resilient body, practically insoluble in the ordinary solvents. It is saponified only with difficulty, and exhibits other characteristics that denote a complete change in the original glyceride. Although insoluble in most solvents, this material is completely soluble in a number of the organic acids, including rosin.

The presence of air has a decided effect upon the rate of solidification, although, as has been demonstrated at different times, air is not essential to solidification, which takes place perfectly well in a sealed vessel, though a longer time is required for the formation of the completely solid product. The statement of Schapringer that the effect of oxygen is entirely catalytic, and that no oxy-compounds are formed is difficult to verify by experiment. In all cases studied by the authors there have been progressively increasing amounts of oxidized materials formed, whenever wood oil or wood oil mixtures have been heated in the air. Also, if the action of oxygen be entirely catalytic, blowing air through the heated mass would hardly show such a decided effect on the rate of solidification in comparison to the rate during unagitated open air cooking. At 165 deg. C., oil in an open dish will solidify in from 20 to 24 hours, while at the same temperature blown oil will solidify in four hours.

Various attempts have been made to prevent or control this solidification at high temperatures, for it is quite generally agreed that china-wood oil should impart the same superior quality to gum varnishes as compared to rosin-linseed varnishes. The high cooking temperature of gum varnish has discouraged any extensive use of china-wood oil in this product, as the temperature is beyond the range to which the oil may be heated without solidification, and the fossil gums do not possess the solvent power for the solid material that is shown by rosin.

Several patents have been taken out covering processes to prevent solidification. One, evidently recognizing the very decided accelerating effect of oxy-acids on the time for solidification, recommends the introduction of a strongly reducing metal. Another, possibly in an attempt to make use of the solvent power of free fatty acid, superheats the oil to a temperature of partial decomposition, after which it does not solidify even when heated for a long time.

Investigators are pretty well agreed that the solidification of wood oil comes as a more or less direct result of the polymerization of the glyceride of elaeomargaric acid, which is the major constituent of the raw oil. This polymerization takes place through a joining at the unsaturated linkings. This, however, is not accompanied by a complete saturation, for a study of the iodine absorption of the raw and heat-treated products shows a difference of only about one-third. The polymerization is not reversed by saponification and subsequent acidification. Inasmuch as the polymerized glyceride is insoluble in the solvents suitable for molecular weight determinations, the best evidence we have that polymerization has really been effected is that the fatty acid from the solidified product has approximately double the molecular weight of the acid from the raw oil.

Morrell has studied the bodying of linseed and poppyseed oils, and has shown that there occurs a similar heat polymerization with these oils, but that there is no solidification, and that the polymerization is by no means complete.

Various explanations have been offered for the solidification of china-wood oil when subjected to this heat treatment. Some experimenters believe that the solid is a uniform product of a chemical reaction which takes place at a rate dependent upon the temperature of heating and goes to completion under the proper conditions. Others take the stand that the solidification is really the development of a colloidal gel, and is not necessarily a product of complete polymerization.

Wolff claims to be able to extract the unpolymerized oil from the dry polymerized product, and he shows in his experiments that the extracted material has not increased in molecular weight, and that the polymerized material constitutes only a minor portion of the gel.

Schapringer says that the solid is a final product of a double reaction, and that the polymer is well developed in the primary reaction, but remains soluble until the second reaction starts, when there is a sudden exothermic formation of the gel.

The authors are led to believe from their experiments, that the solidification is due to the formation of a colloidal gel, and, although, in the case of heated oils, a direct result of the presence of the polymer, the gel formation does not necessarily accompany the polymerization. The methods for control of solidification are simply means for hindering the gel formation, and exert comparatively little effect upon the polymerization.

A somewhat similar colloidal gel makes its appearance when the oil is treated with a solution of sulfur chloride or iodine. The time for gel formation may be regulated by adjusting the strength of solution used. In the case of the idoine-china-wood gel, the solidification may be entirely prevented by the introduction of a comparatively small amount of alcohol. This does not interfere with the formation of the iodine addition products, but acts to keep the colloid in solution.

The decomposition products formed during superheating of the oil must act similarly toward the oil in preventing solidification during subsequent heating. It is possible, by heating china-wood oil to 350 deg. C. for only a short time, to prevent solidification from heat, even though the oil may be subjected to heating at the ordinary solidification temperatures for long periods. This still liquid product of heat treatment exhibits most of the characteristics of regularly polymerized oil. It contains a large amount of glyceride of high molecular weight, together with some free acid and a considerable quantity of unsaponifiable matter. This unsaponifiable material must exert some influence in preventing the natural solidification of the oil, for it seems hardly possible that the small amount of free acid present should act in any different manner from the same amount of free acid added to the original oil. It takes considerably more added fatty acid to prevent gel formation than has been shown in any of the superheated products with which the authors have worked.

Undoubtedly the effect of rosin upon heated oil is also one of solution or gel prevention rather than one of suspension of reaction. It should, then, be possible to show the progress of polymerization as influenced by time, temperature, and other conditions, and entirely independent of the rosin present. There might also be other reagents that would exhibit the same ability to control. The development of a nonpolymerizing wood oil will probably be along these lines.

To keep the finished product light in color, and to avoid undue loss from decomposition and volatilization of the gum, it is common practice, in varnish manufacture, to subject the oil to a preliminary heat treatment, to bring it to a body at which the final cook may be comparatively short. In the case of china-wood oil, the polymerization during this preliminary heating must be considerable, and inasmuch as this polymerization reaction is not ordinarily considered to be reversible, the function of rosin in these mixtures must be one of gel prevention.

In the experimental work of which this paper is a preliminary

discussion, the heating was carried out on the mixtures rather than on the individual constituents. The matter of color was of little consequence, and in order to get a more uniform set of results it was thought advisable to permit the rosin to exert its influence during the whole time of heating.

The first problem in the study of the polymerization of chinawood oil in the presence of rosin was the development of a satisfactory method of separation of the various possible constituents of the final mixture.

An attempt was made to use a modification of the Twitchell separation, by forming the thyl esters of the fatty acids, and their subsequent separation from the rosin and from each other. This method gave a more or less satisfactory separation of the oils from the rosin, but the esters of the polymerized and unpolymerized oils did not show sufficiently pronounced differences upon which to base a method for their separation.

A modification of the method suggested by the authors for the separation of raw chinawood oil from adulterating oils, served the purpose quite well.

The sodium soaps of the fatty acids of both the raw and heat-treated oils are insoluble in absolute alcohol, while sodium resinate is soluble in that menstruum. If proper precautions be taken for the control of temperature and concentration, the soaps of the fatty acids precipitate in a sufficiently granular form to permit of ready filtration and washing.

The subsequently freed fatty acids may be dissolved in warm alcohol of about 80 per cent. concentration, from which the comparatively insoluble elaeomargaric acid may be crystallized by cooling. These characteristic crystals of elaeomargaric acid may be weighed and the elaeomargaric acid computed by difference. The oxy-acid present may be separated from the residue by precipitation from petroleum ether. In this way it is possible to get an estimation of the total fatty acid, the unpolymerized acid, the oxy-acid, the polymerized acid and the unsaponifiable.

An extensive study of chinawood-rosin heat-treated mixtures, the results of which are now being tabulated, demonstrates quite conclusively that rosin exerts no inhibiting effect upon the polymerization of chinawood oil, either at high or at low temperatures.

THE ANALYSIS OF CHROME YELLOWS AND GREENS

From inquiries it appears that the determination of the composition of chrome yellows and chrome greens is not well understood in many color and paint works; and the excellent publications of the Bureau of Standards on the analysis of inks help only in a degree. The method here given, writes A. Given, is the result of a great deal of work and experience with these colors, and has given excellent satisfaction.

Method

Moisture and Lead Carbonate—Weigh out accurately about 1 gram of the yellow or green into a small beaker, and dry for 4 hours at 105-110 deg. C. Calculate the loss in weight as water. Add 50 c.c. of 50 per cent. acetic acid to the dry substance in the beaker, mix thoroughly, and let stand over night. Filter through a tared Gooch, wash with hot water, dry, cool and weigh. Calculate the loss from dry weight as lead carbonate.

Lead Sulphate and Chromate—Weigh out accurately about 1 g., wash into a 250 c.c. beaker, add 50 c.c. water and 50 c.c. of 25 per cent. caustic soda and boil for 5 or 10 minutes. Filter through a tared Gooch, wash thoroughly with hot water, cool the filtrate and make up to 250 c.c. Save the residue. To 50 c.c. of the solution add an excess of hydrochloric acid and 5 c.c. alcohol and boil until the chromate is reduced to chromic chloride. Add an excess of barium chloride, boil, let settle, filter on an ashless paper, wash, burn and weigh as barium sulphate. Calculate to per cent. lead sulphate.

To 50 c.c. of the above solution add an excess of nitric acid, heat to boiling and add 25 c.c. boiling saturated solution of potassium bichromate. Boil 1 minute, let settle, filter through a tared Gooch, wash, dry and weigh. Calculate as per cent. lead

chromate. From this amount subtract the lead sulphate and lead carbonate, both calculated to lead chromate, and call the difference actual lead chromate present.

Residue—Fill the Gooch containing the residue from the solution for lead sulphate and chromate with hot 1:1 hydrochloric acid, let stand 10 minutes, filter and wash with hot water. Repeat twice, wash thoroughly, dry and weigh. Calculate remaining residue as per cent. barytes or china clay according to base.

Pure Blue—The sum of all the previous determinations is subtracted from 100, and the difference called pure blue.

WHY BLACK?

With the time of the year when new models are settling down into regular production it is to be noticed that a few manufacturers are breaking away from the black finish that lately threatened to become universal. Of course, the reason for using black in the first place was that it was cheaper than a color and a little black enamel has a great covering power, but black is the very worst paint that could possibly have been chosen for automobile finishing.

Firstly, black shows the tiniest speck of mud or dust long before any other color and two cars starting out in the morning, one black and the other gray, will look totally different at the end of the same run. In a day's use in town, even in good weather, a black car loses its freshly washed appearance almost at once, and by the afternoon it is dingy. On the other hand, a gray or blue or brown, even a dark green or a maroon tint, will look fresh for days together.

Then again black is dependent absolutely upon its varnish, for without the gloss it rapidly takes on a rusty tinge like a hobo's coat, which no washing will ever remove. A colored car, says Automobile, looks its best, of course, when the varnish is new, but when it has eventually gone dull it still lacks the seedy appearance of old black; it still looks fresh after a wash and the owner's pride in his car is generally more lasting. What's the use in washing a car that looks none the better for it?

The day of bright colors are gone perhaps; some yearn for brilliant reds and yellows, but good neutral tint browns and grays that both look well and wear well ought to be considered by manufacturers much more than they have been.

USE OF WHITE LEAD IN AUSTRALIA

The Coachmakers' Society of Adelaide, says the Australasian Coach Builder and Wheelwright, recently gave special attention to the question of the risk attending the use of lead in vehicle painting. The trade was circularized, and a largely attended meeting resulted. It was rightly recognized that danger was almost entirely in connection with the inhalation of dust arising from the use of white lead sandpaper stopping. After an interesting discussion the following resolution was carried, a copy of which the secretary was instructed to forward to the various coach and motor car firms:

"That in the opinion of this meeting the use of dry white lead, known as sandpaper stopping, is fraught with danger to those using it, is detrimental to health, and its effect is shown in after years. We therefore respectfully ask that its use be discontinued in the painting of all vehicles running on road or rail."

MITCHELL OUTING

On Saturday, August 7, the Mitchell Wagon Co., of Racine, Wis., entertained its employes and their families at a picnic at Thompson's Grove in that city. More than 500 enjoyed the hospitality of the company and pronounced the affair a huge success. Refreshments were provided by the management. There was a program of athletic events for men, women and children and prizes awarded to winners. Prizes were also given to the largest family, the oldest man, the oldest woman and the youngest baby.

ANNUAL REPORT OF INSTRUCTOR OF TECHNICAL SCHOOL

In his annual report for the Technical School for Carriage Draftsmen and Mechanics under the auspices of the Carriage Builders' National Association, Instructor Andrew F. Johnson makes the gratifying statement that the last graduating class was the largest since the school was organized in 1880. The graduates are now filling responsible positions in auto and auto body and vehicle factories. While the evening class men work in and around New York they get positions after graduating all over the country. The report follows:

To the Board of Trustees of the Technical School, Daniel T. Wilson, Esq., chairman.

Gentlemen—I herewith present my report of the school for the year which closed yesterday.

The day and evening classes opened for the season in the school rooms in the Mechanics' Institute Building located at 20 West 44th street, New York City, on September 28, 1914. There were ten day students and 57 evening students.

The day students came to New York on purpose to attend the school and were from the following named places: Two from Connecticut, one from Indiana, one from Massachusetts, two from New Jersey, three from New York, and one from New Zealand. Five of these men were body makers, two were general woodworkers, two were office men and one was a blacksmith. Their average age was 23½ years.

Nearly all the evening students claimed the Greater New York City as their home, only a few coming from the nearby towns in New Jersey.

The average attendance for the whole season was nearly 97 per cent. in the day class and 89 and over in the evening class. The day and evening classes closed for the season on April 1, 1915.

There were seven graduates from the day class and six from the evening class. This was the largest graduating class since the school was organized in 1880. At the exhibition of work on April 8, 1915, more good work was shown than ever before, and the school rooms were crowded with visitors during the three hours that the exhibition was open.

Corresponding Department

This department was opened in 1883 and has been carried on since that time. Since September 1, 1892, when the present instructor was placed in charge, this correspondence department has been open continuously and has been of great help to hundreds of men all over the United States, Canada and other countries. This report covers the work done since September 1, 1914:

New students	37
Drawings received	1,615
Examination papers received.....	337
Lesson papers sent out.....	1,787
Letters sent out.....	1,842
Letters received	1,467
Rating cards sent out.....	1,952

It may be well to state here, that when a drawing is received by the instructor in response to any one of the lessons given out, he inspects the drawing carefully and then sends the student a card of rating, giving the student the rating that his drawing deserves. This rating has a maximum of ten. At the same time further instruction is given to the student if necessary, as well as criticism and correction of his work. A glance at the table shows the large number of letters that have been received from students the past year, as well as those sent out in relation to the work.

During the past year eight of these corresponding students have finished the entire course and have been granted certificate of graduation.

In General

All three departments of the school have been active and the students have done excellent work. The school is becoming better known all over the country, and in fact over the whole world. In proof of this statement I may say that we have had as students at different times since 1901, six men from far-away

New Zealand who came to New York for the purpose of attending the school. Graduates may be found in nearly every shop where vehicles are built, and they are usually holding the positions where a high grade of skill is required.

In conclusion I wish to thank the Board of Trustees for their help in guiding the work of the school, and for their kindly personal interest made manifest in many ways.

Our excellent trade journals are always ready to publish any items regarding the school which may interest the vehicle trade. This courtesy is highly appreciated and thanks is gratefully tendered herewith.

Respectfully submitted,

ANDREW F. JOHNSON,
Instructor.

STOP-OVER FIGHT WON

In a decision made public August 28 the Interstate Commerce Commission ordered the railroad companies to cancel the tariffs from which the stop-over service had been omitted.

These tariffs were filed last fall and on request of shippers' associations, including the National Implement and Vehicle Association and the National Federation of Implement and Vehicle Dealers' Associations, were suspended until March 31. Later the suspension period was extended by order of the commission, pending hearings. Hearings were held in May and testimony was given by officials of the two associations and other manufacturers and dealers. The case was then submitted to the commission for final decision.

The commission holds that the stop-over service has a tendency to increase wholesome competition and that cancellation of the service would increase discrimination. It declares that the service is beneficial to the carriers because it increases car-load business which can be handled more economically than small shipments.

Without committing itself as approving stop-over service in all lines and under all circumstances, the commission holds that the carriers have failed to show that they are justified in withholding the service as proposed by the above-mentioned tariffs. Hence the carriers are ordered to cancel said tariffs, which means that the stop-over service will be continued indefinitely.

This finding has been anticipated. Ever since the hearings in May the officials of the implement associations have been confident that the testimony given was sufficiently strong to convince the commission that the practice of stopping cars for partial unloading or to complete loading was not a privilege but a service for which shippers were paying adequately; also that the withdrawal of the service would be a handicap to the small dealer and tend to increase prices to consumers.

The stop-over service is used largely in the implement trade, probably to a greater extent than in any other line. Dealers and manufacturers who make economical use of the service are under lasting obligations to the dealers' National Federation and the National Implement and Vehicle Association for the great fight they made to prevent its withdrawal.

DETROIT FACTORIES EXPAND RAPIDLY

America's automobile prosperity may be gauged from the statement that the twelve leading Detroit automobile companies are at present engaged in increasing their plants. The total amount of this increase is given at \$5,000,000 cost 850,000 square feet of floor space, with offering employment to 5,000 additional men. All these additions are for domestic production only, and have no connection whatever with so-called war orders.

KELLY TRUCK CHANGES NAME TO SUNSET TRUCK CO.

One of the most important changes in the name of truck manufacturers has been made by the Kelly Motor Truck Co., of Springfield, O. The name of the concern has been changed to the Sunset Truck Co., by papers filed with the Ohio secretary of state.

SELLING ELECTRICS MINUS BATTERIES

Movement for Universal Renting System Said to Be Rapidly Growing

While it is impossible as yet to give a fixed idea of how the interchangeable battery renting system will work out on vehicles so difficult to standardize, there are many who predict an eventually successful outcome of the plans now under way.

It is reported that a feasible plan for a universal battery renting system has been worked out by a Chicago man, who is said to have the co-operation of several New York representatives. It is stated that this system will be publicly announced in the near future.

The opinion of many in the industry is that the electric vehicle business, both as regards pleasure and commercial cars, is on the threshold of a change.

Changes that are expected to take place are directly traceable to the rapidly increasing practice of renting battery service. This, in turn, has made it possible for dealers to sell electric cars without battery equipment and enables them to quote prices with a reduction of from \$200 to \$800 less per vehicle. What the result of price reduction and the inauguration of battery rental service will be as regards the future popularity of both the pleasure and commercial electric car, is a matter of much speculation on the part of those engaged in this business throughout the country.

It has been the experience with practically all dealers in electric cars that lately there has been a growing demand for cars without the batteries. This has been especially true in certain New England centers and in the middle west, although in New York no appreciable demand for cars without this equipment has made itself felt. In Hartford, Conn., about three years ago, the practice of renting battery service was inaugurated by several of the charging stations and has proven itself to be a success.

It is reported that a Chicago concern will sell its 1916 electric passenger cars with or without batteries, deducting \$270 when sold minus the batteries. Arrangements are being made to rent batteries in Chicago, at \$20 per month the first year and \$16 per month the following years. The concern renting batteries agrees to keep them in repair and if the battery capacity falls below 80 per cent., it will renew the parts free.

The idea worked out by the General Vehicle Co. and Electric Storage Battery Co. in and around Boston, whereby electric truck users may purchase vehicles without batteries and buy battery service at a fixed charge through the interchangeable battery scheme has opened the eyes of manufacturers to at least some of the possibilities of reciprocal arrangements. This interchangeable idea has also been carried out in San Francisco, Spokane, Baltimore, Worcester and other centers and seemed in all cases to work out excellently. The result has been that the fever has spread throughout the field and many have gone so far as to predict that the battery proposition will work itself out on the same basis practically as the Prest-O-Lite tank arrangement, whereby the owner of one of these tanks is able to secure renewals at a nominal cost. The only difference between the two ideas seems to be that the battery will not have to be purchased, but rather a fixed charge made for the service.

According to the views of the believers in the battery rental system, the only factors working against the development of the electric vehicle industry are the mileage limitation and price. With the battery rental system giving all the mileage desired and the practice of selling the car without the battery giving the reduction in price the idea is that these two factors will be largely overcome. One of the other advantages claimed is that a car in commercial service or even in touring use need only carry a battery of sufficient size for its desired trip mileage, thus a car on a 100-mile trip will take a 100-mile battery while on a 25-mile trip. When asked regarding the demand for cars minus battery in New York City the representatives of the electric car interests there all stated that while there has been

no appreciable demand, in other parts of the territory there is an indication that the practice of battery rental is growing.

CARRIAGE AND WAGON INDUSTRY IN NEW JERSEY

Products for Year Ending October 31, 1914, Valued at \$1,313,654

The Bureau of Industrial Statistics of New Jersey, in its thirty-seventh annual report, recently issued, presents in its several tables some interesting information regarding the carriage, wagon, saddlery and saddlery hardware business, in that state.

Twenty-eight carriage and wagon firms sent reports to the Bureau, 20 of which were private firms and eight were corporations. There were 27 persons connected with the 20 private firms and 32 stockholders connected with the eight corporations, making a total of 57 partners and stockholders connected with the industry throughout New Jersey. The total amount of capital invested in the business by the 28 concerns is \$934,061. Of this \$304,489 is invested in land and buildings, \$160,383 in machinery and tools, and \$469,189 in bills receivable, stock in process of manufacture and cash on hand. The cost value of the stock used during the preceding year was \$618,084, and the selling value at the manufactory of the goods made was \$1,313,654.

The average number of persons employed in the 28 firms was 650. The total amount paid in wages or earnings was \$424,974. The average earning per employe for the year covered by the report was \$653.80.

Three establishments worked overtime during the year, the average number of overtime hours being 1,451. The average number of hours of work per week for all of the concerns was 56.18.

Eleven steam engines were used, five gas or gasoline engines, one water wheel and 28 electric motors.

Ten saddlery and harness hardware firms reported. Two of these are private firms and eight are corporations. The total number of partners and stockholders in the ten are 54. The total amount invested in these ten concerns is \$2,030,190. Of this \$304,087 is invested in land and buildings, \$327,773 in machinery and tools and \$1,398,330 in bills payable, stock in the process of manufacture and cash on hand. The cost value of the stock used during the year preceding was \$715,437, and the selling value at the manufactory of the goods made was \$1,708,000. The average number of persons employed by the ten concerns is 892. The total amount paid in wages or earnings for the year covered by the report was \$488,724. The average yearly earnings per employe was \$547.90. But 74 of the 892 employes received more than \$20 per week, and only 17 more than \$25 a week. The average number of hours worked per week was 56.20. Two concerns did overtime work, the average number of hours of overtime work done being 3,668.

Only four manufacturers of saddles and harness are reported. These four concerns have a total of eight partners and stockholders. The total amount of capital invested is \$37,250, and the total number employed is 29. The total paid in wages and earnings for the time covered by the report was \$14,568. The average yearly wage per employe was \$502.34.

COMING DEMAND FOR PARTS FOR EXPORT

American parts makers and manufacturers of complete vehicles should prepare now for the demand for motor truck parts which will follow the large sales of American vehicles abroad, according to the advice of a European army officer. Besides the demand on the part of owners of American motor trucks abroad there is every indication that the increased demand for motor trucks which is expected to follow the war due to reconstruction of former transport means that European manufacturers will undertake the production of assembled vehicles and the demands for American standard parts will be very large.

OFFICIAL ANNOUNCEMENT 1915-1916 TECHNICAL SCHOOL FOR CARRIAGE DRAFTSMEN

The classes in carriage, wagon and automobile drafting and construction, carried on under the auspices of the Carriage Builders' National Association and the Automobile Chamber of Commerce will open in the last week of October. Autumn term closes at Christmas. Winter term opens in the first week of January and closes in the second week of May.

Requirements for admission to the day or evening classes require that the applicant must be engaged in the manufacture of pleasure or business vehicles, must be 16 years of age or more, and be able to speak, read and write English, and to write a fairly good business letter.

The day class is to accommodate pupils who wish to devote their whole time to the study of vehicle drafting. This class will meet each week day except Saturday during the term. Hours: 9:30 a. m. to 4:30 p. m. Instruction is free.

The evening classes meet Monday, Wednesday and Thursday from 7:30 to 9:30 o'clock. Instruction is free.

The pupils will be divided into three distinct classes, namely: the introductory or free-hand class, the class for the study of descriptive geometry, and the class for scale and full-size working drawings, and the following gives a general outline of the proposed studies: 1. Linear designing, including freehand, scale, and full-size drawing. 2. Geometry, applied to carriage, wagon and automobile construction and known as the "French rule" of drafting. 3. Complete carriage and wagon drafting and automobile body drafting. 4. Principles involved in the suspension and draft of carriages and wagons. 5. Perspective and colored drawing of carriages, wagons and automobiles.

Drawing instruments, drawing boards, and other things necessary for the work, may be had at the school at very low prices.

At the close of the term certificates of graduation will be given to such pupils of the day and evening classes as pass the necessary examinations.

The following conditions govern the graduation of pupils:

No pupil will be entitled to a certificate of graduation unless he can pass, in the judgment of the trustees, a satisfactory examination in all the branches taught. He must upon examination, evince a thorough knowledge of geometry as applied to carriage building, known as the "French rule of drafting"; show facility in making free-hand drawings, be able to make scale and full-size working drawings of carriages and wagons complete and automobile bodies. A knowledge of perspective and colored drawings is also required.

He must also have a knowledge of arithmetic through square root, to work out the problems connected with draft and suspension, and thus determine the proper size of wheels, axles and springs, and he must be able to write clearly and correctly the orders for the same to the manufacturers of these special parts.

Graduates are in demand, and are holding good positions in the leading automobile and carriage factories.

Correspondence Department

The correspondence school is open the whole year round and costs \$5 per term or \$15 for the full course of three terms. Instruction is given by correspondence to the employees of carriage, wagon and automobile builders and members of the accessory trade, at their homes, by means of the so-called "Chautauqua system." This system consists in giving instruction to out-of-town pupils through the mail, by lesson paper, on making free-hand, geometrical, scale and working drawings, each paper calling for responses in the form of drawings or written replies, which are afterwards examined and corrected by the instructor, Andrew F. Johnson.

Three terms are required in order to complete the full course of corresponding lessons, which are 114 in number, as follows:

First term. first series—Free-hand drawing, 11 lessons; second series, the use of mathematical instruments and curves, and mode of sketching a carriage, 10 lessons; third series, geometry applied to carriage construction; projection of points, lines and

surfaces, laying out working draft of a phaeton body, and generation of surfaces illustrated on a phaeton, eight lessons.

Second term—Fourth series, movements of triangles and lines in space; rules applicable to plane faces illustrated on a trestle, a phaeton pillar, a cabriolet pillar and bottomside of a landau, showing the method of finding the true size and shape of a pattern, and the level of shoulders of the cross bars; thirteen lessons. Fifth series, in finding the dihedral angle, or in workshop parlance, finding the bevel of the leg of a trestle, phaeton pillar, cabriolet pillar, and landau bottomside; six lessons. Sixth series, on the choice and disposition of joints; three lessons. Seventh series, on the development of the outside surfaces of carriage and automobile bodies, including round corners with wheel-house; nine lessons.

Third term—Eighth series, laying out square and round-cornered stick seats, and round-paneled seats; generation of double-curved surfaces, illustrated by a barouche with round bottomside, including the study of different forms of bodies, such as drop-center landaus, and broughams with ogee turn-under; ogee front-quarter, bottomside of coaches and barouches; cheat line and proportional triangle illustrated on a Clarence body and on a C-pillar back-quarter; 24 lessons. Extra series, the draft of vehicles and division of weight, displacement of center of gravity, and objectionable modes of suspension, four lessons. Miscellaneous series, new methods of determining the cheat line; locating the joints in top braces; developing outside surfaces having different side sweeps and turn-unders; developing mud guard surfaces by means of radial lines and by triangulation; developing the surfaces and framework of different forms of cowls, developing roofs, developing the round form of rear end of automobile bodies; 26 lessons.

On the receipt of tuition fee, all lesson papers for the term will be mailed to the pupil at once, in order that he can see to what the lessons are tending, and any pupil who has finished the study of the full term lessons, will, by sending tuition fee for the next term to the instructor, receive the whole number of lessons for that term.

Written examinations will be required at the end of each series of lessons, in order to test the progress and proficiency of pupils, and at the close of the course diplomas will be awarded to those deserving such recognition.

All employees of manufacturers of carriages, wagons and automobiles, and the trade accessory thereto, doing business within the United States and Canada, are eligible to membership in these classes of corresponding pupils, the only conditions of entrance being the remittance in advance, by postoffice money order, of \$5, which will cover all fees for instruction during one term.

Each pupil will be expected to provide himself with necessary drawing instruments, papers, etc., and to pay postage on all communications sent to the teacher.

Works of reference and text books will be recommended to pupils who show the need of such help; and if desired, these, as well as drawing instruments, papers, etc., will be supplied at cost price by the teacher.

This department is kept open during the entire year, and pupils may join at any time.

Day students in this school may enter the evening classes conducted in the Mechanics' Institute and take up subjects not taught in the Technical School for Carriage Draftsmen and Mechanics, such as machine drawing, mathematics, physics, decorative design, modeling, etc. Instruction is free.

Board of Trustees of the Technical School: Daniel T. Wilson, chairman; Hon. Franklin Murphy, W. W. Ogden Charles J. Richter, Wm. R. Innis, secretary. Honorary Trustees: Chas. Clifton, Herbert H. Rice.

All communication relating to the Technical School for Carriage Draftsmen and Mechanics should be addressed to Andrew F. Johnson, 20 W. 44th street, New York City.

TRENTON BODY BUILDS ADDITION

Fitzgibbon & Crisp, Trenton, N. J., makers of automobile bodies will build an addition to its plant.

WOULD ORGANIZE FOR WAR

Business men of the United States are as patriotic as any men living, and if the United States wants assurance that it can effectively prepare for war so far as land troops are concerned, without confusion and without the terrific waste of money that has burdened the allies, manufacturers should be immediately banded into a "legion of honor" to organize grim and efficient forces that can be relied on by the government in time of need. This is the basis of a carefully worked out plan of Martin J. Gillen, president of the Mitchell Wagon Co., of Racine, Wis., for co-operation among the manufacturers in being in readiness to aid the government in emergencies. Mr. Gillen says that under his plan within 90 days from the day of giving the orders there would be delivered to the United States the following equipment:

Sixty thousand three-fourth ton motor trucks, for trucking supplies or equipping with machine guns; 10,000 to 15,000 two to five ton motor trucks for trucking machine guns, armored cars, etc.

Two thousand to 5,000 motor busses, carrying from 15 to 18 passengers each.

Ten thousand 25 to 50 horsepower tractors.

Fifty thousand United States army wagons, and all other material needed by the United States government to supply the army as rapidly as it is mobilized, excepting only the supply of guns, cartridges, shells and explosives, which supply, however, would be greatly facilitated under this plan, without interfering with the war orders that are now placed and being carried out in this country.

It is proposed to have the manufacturers or business men organize by groups and appoint representatives to a central honor board. These groups would bring about a standardization of equipment, keep on hand samples of the standards and dies enough to supply the different manufacturers and study the question of raw materials and arrange for keeping an immense reserve supply. Bids would be submitted every six months according to the needs of the government outside of the demands of the army in times of peace.

MR. BRODIE SUCCEEDS STEELE

Robert Brodie has been elected secretary and manager of the Owensboro Wagon Co. Mr. Brodie took general charge of the business of the company on September 1, succeeding to the position made vacant by the resignation of W. A. Steele, who has taken the position of president and general manager of the Owensboro Ditcher & Grader Co., a corporation which he organized about a year ago with a large capital.

Mr. Steele will retain his holdings of stock in the wagon company and remain on the board of directors. He was also elected vice-president of the wagon company and will continue to give what assistance to the successful conduct of the company's business that he may be called upon for.

Mr. Brodie has been with the Owensboro Wagon Co. for 12 years. He is a large stockholder and is fully acquainted with the company's affairs, as he has been treasurer for about ten years.

W. P. Gruesling, who has been connected with the Kentucky Wagon Mfg. Co., Louisville, Ky., for 35 years has resigned his position to become sales manager for the Owensboro Wagon Co. Mr. Gruesling for many years was secretary of the Kentucky company, but during recent years has served as sales manager for the southern district.

ELKHART COMPANY REORGANIZED

At a meeting held in Elkhart, Ind., August 30, the Elkhart Carriage & Harness Co. was reorganized. The capital stock of \$100,000 was not increased, it having been arranged to use new funds in developing the manufacture of a low priced automobile. Five new stockholders are in the reorganized company. They are James A. Bell, William E. Wider, W. H. Patterson,

W. H. Foster and C. T. Swaffield. The board of directors now numbers seven instead of three. William B. and George B. Pratt, who have for many years been identified with the concern, retain their original holdings. Officers were elected as follows: President, William B. Pratt; vice-president, W. H. Foster; secretary, George B. Pratt; treasurer, James A. Bell; manager, W. H. Patterson.

The Elkhart Carriage & Harness Co. has for many years manufactured carriages and various grades of harness. When the auto demand became pronounced the concern started making the Pratt Elkhart machine, a high priced car. It is for the purpose of financing a \$750 automobile that the reorganization has been brought about.

703,527 CARS BUILT IN PAST YEAR

The statistics for the past year, as compiled by Alfred Reeves, general manager of the National Automobile Chamber of Commerce, Inc., show the production to have been 703,527 cars, valued wholesale at \$523,463,803, which is an advance of 36 per cent. in the number of cars and more than 10 per cent. in value over the previous 12 months.

Sales of passenger cars of all types to June 30, which is the end of the year in the industry, were 665,826, for which the manufacturers received \$450,941,131, while the sales of commercial vehicles of all types are estimated at 37,700, valued at \$72,522,692. The figures for 12 months ending June 30, 1914, were 515,101 cars, passenger and commercial, valued at slightly more than \$485,000,000.

While the number of cars increased 36 per cent., the value increased only 10 per cent., indicating the greater value the makers have been giving purchasers as manufacturing costs were brought down and fewer changes were made in chassis construction.

DECREE ISSUED IN RIM SUIT

Following the opinion of Judge Hunt in the case of Louis H. Perlman against the Standard Welding Co., an interlocutory decree has been issued in favor of Perlman, perpetually enjoining the Standard Welding Co. from further infringement of his patent No. 1,052,270 on rim construction and appointing Clarence S. Houghton, of New York City, a special master to determine the amount of damages. Costs of the suit are to be paid by the Standard Welding Co. The decree upholds the validity of the patent and rules that Perlman's exclusive rights thereunder were violated. The decree was issued in the U. S. District Court for the Southern District of New York.

A brief survey of the decree indicates that not only do all side wedge demountable rims infringe the Perlman patent but also all split wedge-ring types fall within its scope.

An order has been issued allowing the Standard Welding Co. to appeal to the circuit court of appeals and bond has been fixed at \$50,000.

WISCONSIN CONVENTION DATES

The Wisconsin Implement Dealers' Association has decided upon the dates for its next annual convention. The convention and exhibit will be held in the Auditorium at Milwaukee, Wis., on December 15, 16 and 17. The main hall will be devoted to the exhibits and the two smaller halls will be used for the sessions of the convention. The association now numbers more than 700 members, and it is believed that the attendance will be the largest in the history of the association. Officers of the Wisconsin organization are: President, L. H. Waite, Seymour; vice-president, D. W. Allaby, Mauston; secretary-treasurer, F. R. Sebenthall, Eau Claire.

The Chevrolet Motor Co., of Canada, Ltd., Toronto, Ont., will on October 1 take possession of the plant of the Dominion Carriage Co., Ltd., West Toronto, which it has purchased. It hopes to have cars ready for delivery in three months.

Trade News From Near and Far

BUSINESS CHANGES

W. S. Berry is retiring from the buggy business at Roann, Ind.

John Hilt has sold his wagon making business at Bristow, Ind., to Sam Hilt and Wm. Hilt.

Haase & Bohle Carriage Co., St. Louis, Mo., has decreased its capital from \$40,000 to \$5,000.

Case & Glover have bought the Kinsley carriage works at Beloit, Wis., and will continue the business.

John R. Brunner, a retailer in vehicles and implements at West Manchester, O., is now out of business.

The Heim carriage and wagon works at Marinette, Wis., has been purchased by John Murphy and Emanuel Andre.

It is reported that Andrew Langston has purchased the implement and buggy business of T. H. Lux, of Randolph, Neb.

Thomas Vandeventer has traded farm land to C. M. Beldon for his hardware, vehicle and implement store at Spencer, Ind.

Elgie F. Myers has purchased the stock of implements, including harness, implements, etc., valued at \$12,000, from L. E. Ager, Peru, Ind.

Woodard & Pierson have taken possession of the implement and vehicle store that they recently purchased from Weddle & Briner, at North Manchester, Ind.

Jerrett Gruder, dealer at Vincent, has sold out his vehicle and implement store to the firm of Scott & Van Horn, of Fort Dodge, Ia., which will continue its operation.

Mrs. J. C. Hardy has sold her interest in the implement and vehicle business that was conducted by her late husband at Dana, Ind., to R. S. Welch, who is now sole proprietor.

P. R. Emmert, Clinton, Ia., has sold his implement business to Louis Christensen, who will take possession at once. Mr. Emmert will retain the automobile, buggy, carriage and harness business.

Edward Wolverton has purchased the John Kindler Buggy Co., at Huntington, Ind. George Kindler, who had been with the company for a number of years, will be retained by Mr. Wolverton.

Fred Schaub, who has been manager of the vehicle and implement store of Schaug, Dowling & Co., at Decatur, Ind., has sold his interest to John Shuey, of Convoy, O. Possession will be given about October 1.

A. Howard, of Galion, has purchased the stock of the Herring Buggy Co., at Mansfield, O., and is moving it to Galion to add to a stock which he has at that place. The intention of the purchaser is to make up the stock into buggies.

NEW FIRMS AND INCORPORATIONS

Thomas Daily, Vincennes, Ind., has opened a hardware, implement and vehicle business.

Leon Haelfrisch will open an implement, vehicle and auto supply business at Two Rivers, Wis.

A new retail firm has been started at Millersburg, O., called Miller Bros. The firm is composed of Martin L. and Levi E. Miller.

Davis Corwin, of Crawfordsville, Ind., will engage in the implement and vehicle business at New Ross, Ind., about September 1.

Austin & Son have opened a new implement and vehicle store in Tuscola, Ill. The company will handle a complete line of farm implements, buggies, wagons, etc.

Thomas Daily has opened a hardware and implement store at 212 Busseron street, Vincennes, Ind., where he will handle a full line of vehicles, buggies and implements of all kinds.

The Self-Greasing Buggy Co., St. Louis, Mo., has been incorporated with a capital stock of \$25,000 by Frank J. Brune, John T. Gins and William F. Schmand, to manufacture vehicles.

FIRES

Fire damaged the Twin City Carriage Works, 160 W. University street, St. Paul, Minn., \$8,000 worth.

NEWS OF THE TRADE

The Cortland (N. Y.) Cart and Carriage Works has added an automobile department to its plant.

The Union Forging Co., Union, N. Y., has let contracts for an addition, 115 x 136 feet, one story.

The McKinnon Dash & Metal Works, St. Catharines, Ont., will start the construction of an addition.

The Collins Carriage Co., Camden, N. J., received bids August 19 for alterations and additions to its factory.

The Martin Metal Co., Wichita, Kas., builder of metal automobile bodies, is planning an addition to its plant.

The Reo Motor Car Co., Lansing, Mich., has started work on additions to be built on three sides of its present plant.

The Hesse Carriage Co., Kansas City, Mo., is building a two-story addition 83 feet long, two stories, to cost about \$25,000.

The Foster Gear Co., Columbus, O., maker of automobile gears, will soon make a large addition to its plant on Kaiser street.

The Cook Buggy Co., Bloomville, O., will remove to Fostoria and occupy the former Storm Buggy Co. plant on East Center street.

The Empire Axle Co., Dunkirk, N. Y., which is planning to enlarge its plant, is increasing its capital stock from \$20,000 to \$100,000.

The Cameron Car Co., Orange, Conn., has been incorporated in Connecticut with an authorized capital of \$200,000 to make and deal in motor vehicles.

The Davenport Safety Tire Co., Little Rock, Ark., has been incorporated with a capital stock of \$100,000 by J. R. Alexander, W. H. McLaughlin, and others.

The F. A. Ames Co., of Dallas, Tex., has been organized for the purpose of manufacturing vehicles of various kinds. G. O. Evans is one of the incorporators.

The Cole Motor Co., Chicago, Edgar C. Frady, president, has arranged for the construction of a four-story service building at 2326 Indiana avenue, to cost \$70,000.

The Crown Fender Co., Ypsilanti, Mich., has increased its capital stock from \$20,000 to \$50,000. Its business is growing rapidly and a larger factory is being planned.

The A. J. Detloff Co., Detroit, Mich., manufacturer of automobile parts, is erecting a three-story addition to its plant. Brass and aluminum foundries are being added.

The Toledo Plow Co., Toledo, O., has sold its bobsled manufacturing business to the Turnbull Wagon Co., Toledo, which will manufacture the bobsleds at its plant in Defiance, O.

The Mogul Motor Truck Co., St. Louis, Mo., is erecting a large assembling plant, and additions to its present works, and will require considerable equipment for which it is in the market.

The Packard Motor Co. has purchased a site in Pittsburgh, and will erect a three-story brick and stone building to cost upward of \$300,000. It will be used for storing motor cars and supplies.

Clarence J. Davis, East Palestine, O., has purchased the plant of the Croxton Motor Car Co., Washington, Pa. He is said to

represent a rubber tire manufacturer, but further details are unavailable.

The Kratzer Carriage Co., Des Moines, Ia., will manufacture a number of styles of commercial bodies for Ford cars that will be ready to be fitted to the chassis without fitting and by the insertion of only six bolts.

The John G. Duncan Co., 308 West Jackson avenue, Knoxville, Tenn., is asking for prices on a rim jointer, spoke lathe and other wood-working equipment. A 12 horsepower feed-water heater is also wanted.

The Falcon Motor Truck Co., Detroit, Mich., has been incorporated with a capital stock of \$20,000 to manufacture motor trucks. The incorporators are Albert B. Hazzard, Otis B. Mallow and Frank T. Lodge.

The Power City Motor Car Co., Hazleton, Pa., with a capital stock of \$5,000, has been incorporated by Harry M. Benjamin, W. C. M. Butler, Charles J. Kirchman and Harry H. Collinson, to manufacture motor vehicles.

The General Vehicle Co. has applied for permits for the erection of an additional unit, 200 x 400 feet, to its Long Island City plant. It is to be one-story, brick and concrete, located at Starr avenue, east of Borden avenue.

The Garford Motor Truck Co., Lima, O., is reported to have received more than \$3,000,000 of business since January 15. Of this \$2,000,000 is stated to be for orders for export. The company is building an addition to cost about \$20,000.

At Defiance, O., the Defiance Machine Works and the Defiance Screw Machine Products Co., both are working 24 hours a day. Rapid progress is also being made there on the construction of the new American Steel Package Co. factory.

The Republic Motor Truck Co., Alma, Mich., is building plant additions having about 19,000 square feet of floor space, to be used as an assembling department and stock room and to be equipped with cranes and machinery to give a capacity of about 25 to 30 trucks a day.

The John Neiner Carriage Co. has purchased the structure which it has occupied since 1910 at 4736 Easton avenue, St. Louis, Mo. The fireproof building was erected for the company in 1910 with a five-year lease with privilege of purchase at expiration. The building is 48 x 100 and the lot is 48 x 140.

The Chandler Motor Car Co., 1105 Swetland Building, Cleveland, O., has awarded contracts for three buildings, including a brick and concrete building, 110 x 403 feet, one story, to cost \$50,000, a boiler house to cost \$5,000 and a two-story brick office building to cost \$15,000. Bolton & Pratt are the contractors.

The Standard Welding Co., West 76th street, Cleveland, O., is pushing the construction of the addition to its plant, 100 x 200 feet, to be used for the manufacture of bent tube parts. It will build a second addition, L-shaped, one section 200 feet long and the other 240 feet long, five stories, the top floor to be used for offices. At a later date two more additions will be constructed.

KELLY-SPRINGFIELD BEHIND ORDERS

The Kelly-Springfield Tire Co. is now 27,000 tires behind orders. As the company manufactures between 1,000 and 1,100 tires a day, this means that it is approximately a month behind orders on its books. The Akron, O., plant continues to operate at capacity, and officials say that business on hand in sight insures a continuance of this rate of operation throughout the remainder of the year.

The company recently entered the truck tire field. By the first of the year it is estimated that it will be possible to make 400 truck tires a day. Enlargement of the plant in order to make this a possibility is now under way. These tires will sell from 10 to 15 per cent. higher than the average truck tire.

The directors estimate a rock-bottom earning of about \$1,500,000 for 1915. Allowing for the difference in dividends after conversion of preferred into common this would mean close to 27 per cent. for the common shares. Net may run as high as \$1,700,000. It is expected that the company will distribute a substantial extra cash dividend this fall.

DISCUSSED TRUCK STANDARDS

The meeting of the Truck Standards Division of the Standards Committee of the S. A. E. was held in New York City on September 7 as scheduled and a variety of subjects were discussed, the principal one being the possibility of reducing the S. A. E. standard diameters for wheels for solid tires to two sizes only. The conclusion reached was that a little more investigation was needed before any sort of action could be taken.

The Foreign Co-operation Division also met jointly with the other division, most of the members being common to both and sundry methods for advancing the work of obtaining universal solid tire standards were considered. Several valuable suggestions were made and it is expected that a progress report will be submitted to the meeting of the Standards Committee to be held in Chicago on October 14.

THE FEDERATION CONVENTION

Secretary Hodge, of the National Federation of Implement and Vehicle Dealers' Associations, announces that the sixteenth annual convention of the organization will be held in Chicago, October 13, 14 and 15, 1915. The Hotel Sherman will be headquarters.

The convention of the Secretaries' Association will be held October 12 at the same place.

A conference will be held as usual with the committee on dealers' associations and the Sales Managers' Department of the National Implement and Vehicle Association. The activities of the Federation during the past year insure a convention of unusual interest.

FLINT VARNISH TO DOUBLE FORCE

The Flint (Mich.) Varnish Works, which were formerly a department of the Durant-Dort Carriage Co., and is one of the large varnish makers, supplying automobile manufacturers and many railroads, will double their working force and employ at least 300 men when four additional factory buildings, to be started at once, will be completed. At a meeting of the directors a 10 per cent. dividend was declared on the \$500,000 of common stock, which is half of the capitalization. The officers are: W. W. Mountain, president and general manager; J. E. Kepperly, vice-president, and William Glidden, secretary-treasurer.

CHALMERS SHIPS \$2,000,000 IN CARS DURING AUGUST

Shipping cars to the value of \$2,000,000 during 26 working days in August, the Chalmers Motor Co. has just completed one of the most prosperous months in its history. At the close of business August 30, the company's books showed that 55 more cars had been shipped in July and August than in the first six months of the last fiscal year, running from July 1 to January 1.

SHELDON WILL TREBLE OUTPUT

The Sheldon Axle Co., Wilkes-Barre, Pa., is increasing its output of worm-drive truck axles by the installation of new machinery and special equipment. After the additions are completed, it expects to treble its output.

At the annual meeting of the D. Wilcox Mfg. Co., manufacturer of forgings, gears, etc., Mechanicsburg, Pa., held July 29, the following officers were elected: President and general manager, Frank E. Wilcox; vice-president, S. F. Hauck; secretary and treasurer, Mervin E. Anderson; directors, Frank E. Wilcox, S. F. Hauck, J. H. Koller, R. H. Thomas, Jr., O. C. Bishop, W. L. Hauck and B. G. Buser.

Henry O. Garrett, Dadeville, Ala., proposes the establishment of a factory for the manufacture of wagon hubs from white oak.

OBITUARY

James J. Casey, 63, of Holyoke, Mass., a veteran carriage maker, died last month.

William Stoltze, aged 67 years, an automobile and carriage manufacturer, died of heart disease at his home, 900 North Winchester avenue, Chicago, July 15. Mr. Stoltze had been in the carriage manufacturing business in that city for 40 years. He moved to Chicago from Copenhagen, Denmark, in 1872. Two daughters survive him.

Edmund R. Thornton, 63, died last month at his home at Bristol, Pa., of diabetes. He was engaged in manufacturing fifth wheels, and previous to his illness was general manager for the Millersburg Fifth Wheel Co.

DEATH OF RICHARD H. BURDSALL

Richard H. Burdsall, treasurer of the Russell, Burdsall & Ward Nut & Bolt Co., Port Chester, N. Y., died August 30 at his country home in North Egremont, Mass., from heart disease. He was also president of the First National Bank, Port Chester, and an officer of the Yonkers Trust Co. and the Westchester Fire Insurance Co. He leaves his widow and two sons.

S. T. DAVIS, HEAD OF LOCOMOBILE CO., DIES

S. T. Davis, Jr., president of the Locomobile Co. of America, died August 31, from hemorrhage of the brain, at Bridgeport, Conn. Mr. Davis was taken ill on Saturday with what appeared to be acute indigestion but a hemorrhage occurred on Monday and his condition became rapidly worse.

Mr. Davis, who had been connected with the automobile industry since June 13, 1899, was born in Washington, D. C., February 8, 1873.

ACTIVE LUMBER MARKET

Inquiries from the vehicle and implement factories are reported numerous in the Chicago lumber market, indicating improved conditions in those industries throughout the country. Wholesalers reported increased demand for hickory rim strips from the automobile and carriage manufacturers. This wood also moved in good volume to the agricultural factories.

It also was reported that at the present time there is a brisk buying movement in this market on the part of European agents.

CARRIAGE COMPANY TO MAKE SCHOOL CARS AND TRAILERS

The Kratzer Carriage Co., of Des Moines, Ia., send us the following announcement:

This company will soon put on the market two or three new items. The first that we will mention is that of commercial or delivery bodies made to fit Ford chassis; we shall make these in eight or ten types and styles, from the high grade, plate glass, paneled body suitable for dry cleaners, ladies' furnishings houses, etc., down through the line of steel paneled bodies for dry goods houses and similar uses down to the open canopy body for groceries and farm produce and the open body suitable for hardware, plumbing, pump supplies, etc. All of these will be furnished to the dealer and the distributor of automobiles at prices that will compete with eastern made goods. The second item is that of an auto trailer. We shall begin with the manufacture of a two-wheel trailer put on a Timken roller bearing axle, that will be suitable for almost any sort of delivery. It will hold 15 ten-gallon milk cans or most any amount of farmers' produce for most any kind of city delivery. The third thing that we might mention is that we shall begin the manufacture of school cars, both glass and curtain types for transporting the children in rural school districts.

WANTS

Help and situation wanted advertisements, 1 cent a word; all other advertisements in this department, 5 cents a word; initials and figures count as words. Minimum price, 30 cents for each advertisement.

PATENTS

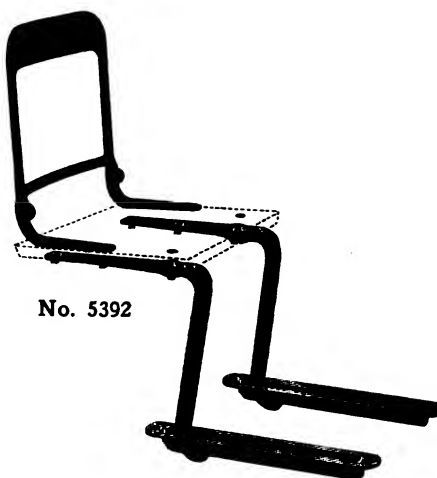
Patents—H. W. T. Jenner, patent attorney and mechanical expert, 606 F St., Washington, D. C. Established 1883. I make a free examination and report if a patent can be had and exactly what it will cost. Send for circular.

CRANDALL, STONE & CO. ENLARGE

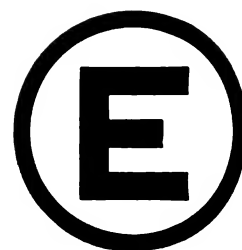
The plant of Crandall, Stone & Co., Binghamton, N. Y., will be enlarged in the near future, giving an additional 16,000 square feet. The company manufactures automobile accessories. The company has been specializing lately in bow sockets, the output of which has been greatly increased during the past two months from a large contract to manufacture for the Ford company. The new addition will be 100 x 40 feet in size and one story high.

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Manufacturers of

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Seat Irons**



No. 5350



No. 5360

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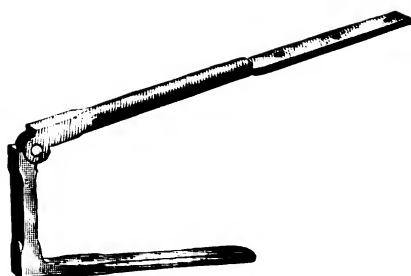


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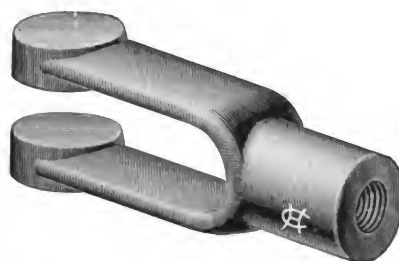
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An experience with STOCK LINES of Vehicle
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Makers of First Quality Nuts and Bolts
AND
THE CLEVELAND BOLT & MFG. CO.
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Makers of the North Ribbed Bolts for Carriages and Automobiles

A Few Words About the North Patented Bolt:
The RIB is elevated above diameter of shank, which gives it great holding power.
It can be used in round hole in either IRON OR WOOD; will not split or bulge the wood; will not rattle or jar loose; is made from highest grade material, will stand the most severe physical test, and is the best finished bolt being offered to the trade today.
↓ The constantly increasing demand is proof of all we claim. ↓
We shall be glad to furnish samples and prices upon application.

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CINCINNATI, O.

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Metal Buggy Seats

FLEUR DE LIS PATTERN



NEW STYLES—ALL SIZES

STRONGEST—NEATEST—BEST

No Solder Used

YOUR VEHICLE SELLS WHEN EQUIPPED WITH

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Write for Prices

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Condition should attend the

TECHNICAL SCHOOL

FOR

Carriage Draftsmen and Mechanics

SUPPORTED BY THE

Carriage Builders' National Ass'n

The object of the School is to teach men to design vehicles and make working drawings, and to otherwise facilitate their work in the shop. Only those men employed in carriage or automobile building or their accessory trades are admitted to its privileges.

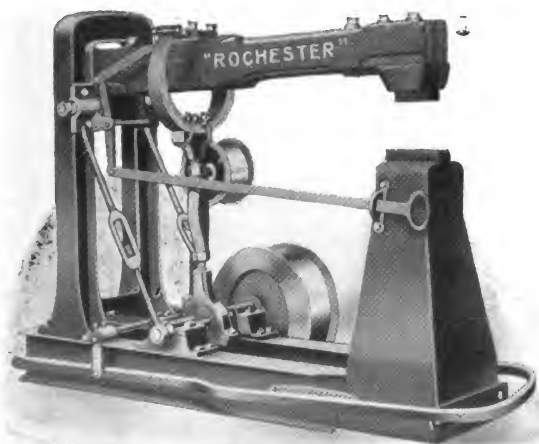
The classes are conducted in three divisions, viz.: Corresponding, Day, and Evening. The former is open during the entire year, while the day and evening classes are in session only from October 1 to April 1.

The tuition is moderate.

For prospectus and full particulars, write to the instructor,

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Rochester Helve Hammer

is a very convenient tool for carriage and wagon smith shops. Adapted to welding tires, axles and all general forging. Built in six sizes and reasonably priced.

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"THREE," says Cunning

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Guaranteed Superior to Coated Splits for Upholstery of Carriages and Automobiles

FABRIKOID, Motor Quality, is the standard upholstery material on a quarter of a million 1915 automobiles, after two years' satisfactory service on thousands of cars.

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MULHOLLAND BUGGY SPRING

Reduces weight of springs one-half.
Made in one size only but will fit bodies
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Write for further particulars and prices.
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Cut Leather to
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"Easy" "New Easy" Allen-Randall



To Cut 5-16, 3-8, 1-2, 5-8, 3-4 inch.

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DROP FORGINGS
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A thorough, practical tuition is given through this correspondence school. The theory and practice of construction, bookkeeping, perspective. Many men now hold good positions through taking the courses of instruction.

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a practical treatise on "The Suspension of Carriages,"
"Bookkeeping," and other carriage building works.

KEYSTONE SPRING WORKS, Inc.

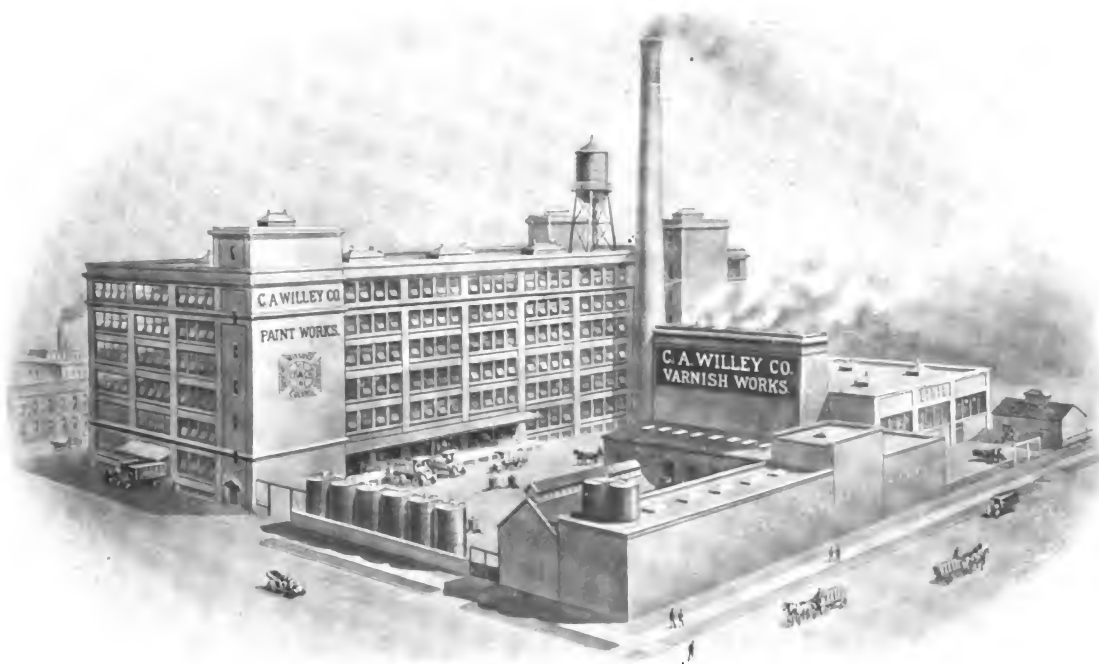
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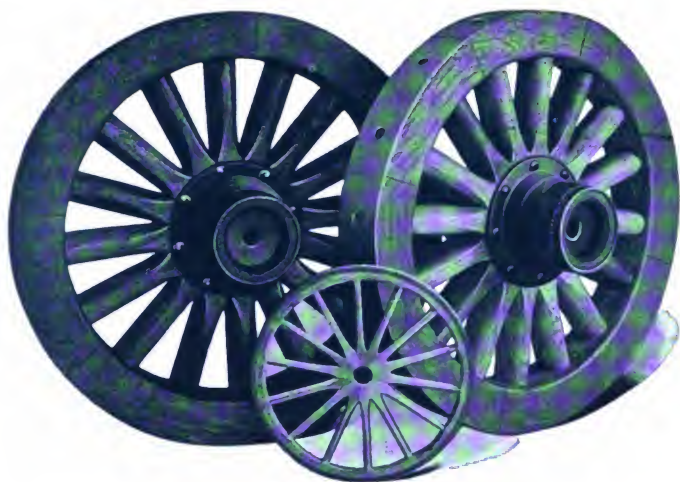
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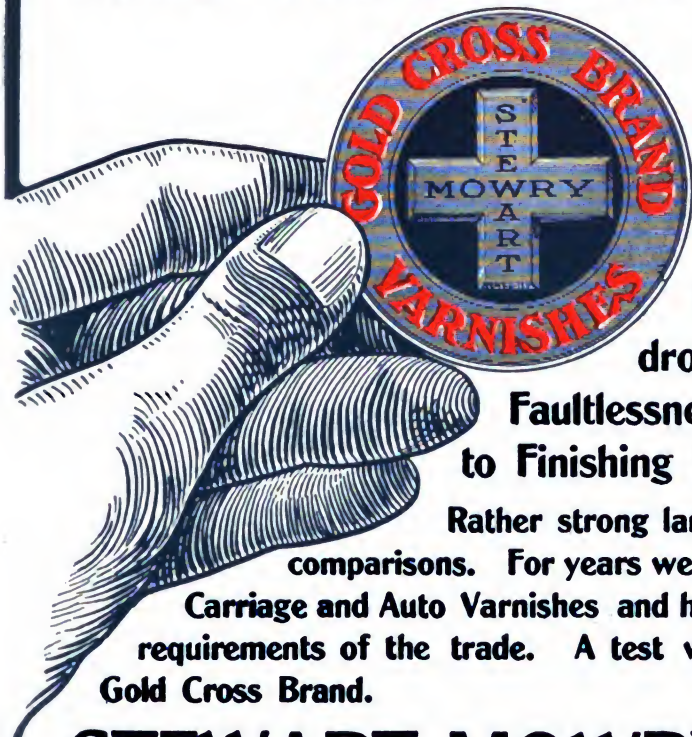
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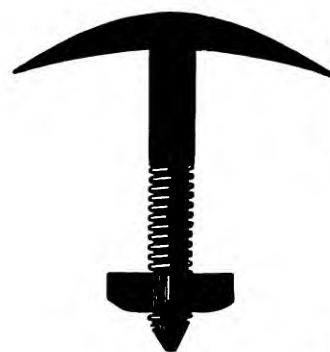
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**Regular or Oval Patterns
For High Arched Axles**

Furnished in rights and lefts for any height of arch. Oval Axle
Clips $\frac{5}{8}$ or $\frac{3}{4}$ width to match Oval Couplings. Bolts, Clips,
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The Hub

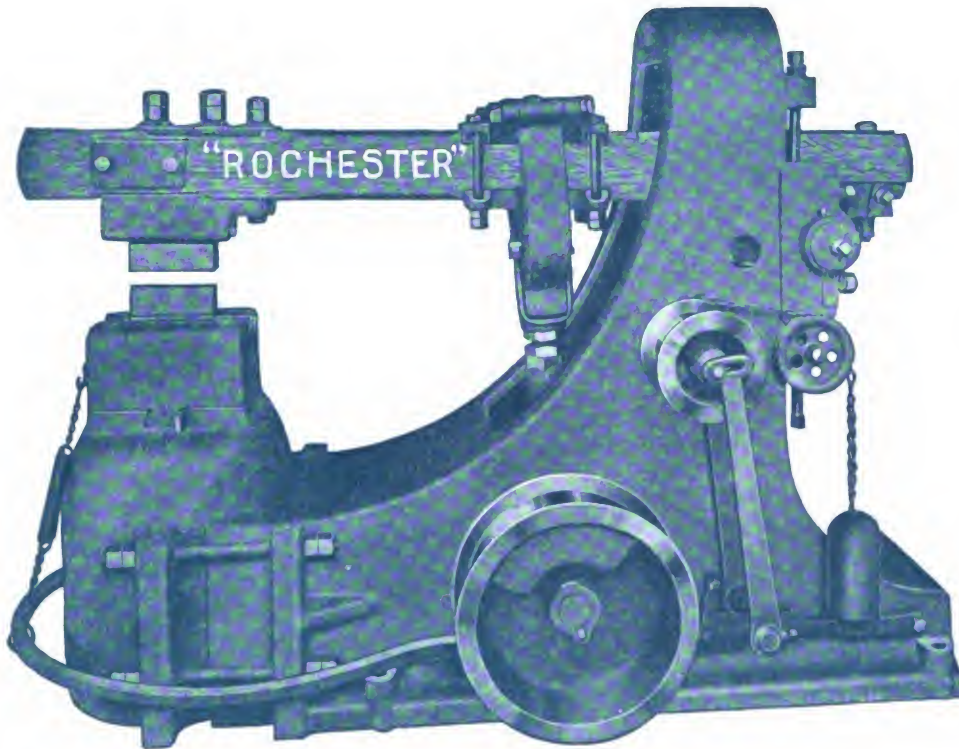
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When you specify "Sheldon" you are not experimenting with experiments, but are getting Axles and Springs with years of manufacturing experience back of them—Axles and Springs that are selected for important work where conditions make reliability supremely important

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A PRODUCT FOR EVERY PURPOSE, PRODUCING DISTINCTIVE RESULTS

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EFFICIENT IN QUALITY AND UNIFORMITY

The Sherwin-Williams Co.

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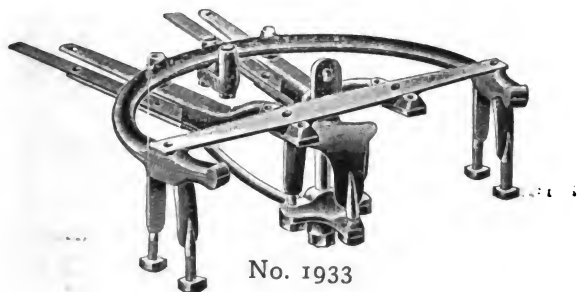
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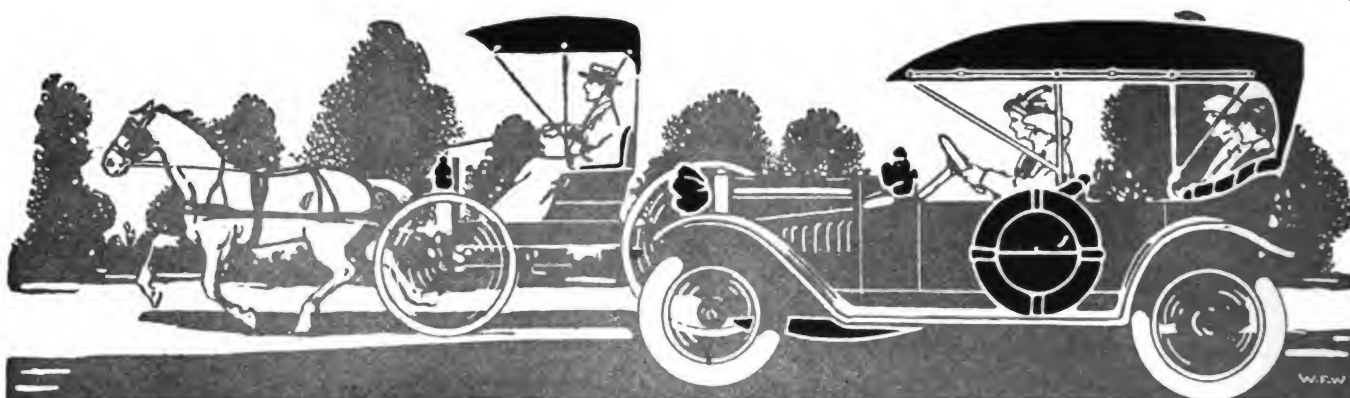
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LEATHER CLOTH
NOW

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The Hub

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Entered in the New York Post Office as Second-class Matter

Vol. LVII

OCTOBER, 1915

No. 7

THE TRADE NEWS PUBLISHING CO. OF N. Y. Publishers of THE HUB

J. H. WRIGHT, President

G. A. TANNER, Secretary and Treasurer

EDISON BUILDING, COR. ELM AND DUANE STS., NEW YORK

Other Publications of Trade News Publishing Co.:

HARNESS (monthly).....per year, \$1.00
AMERICAN HARNESS AND SADDLERY
DIRECTORY (annual).....per copy, \$5.00

THE HUB is published monthly in the interest of employers and workmen connected with the manufacture of Carriages, Wagons, Sleighs, Automobiles and the Accessory trades, and also in the interest of Dealers.

Subscription price for the United States, Mexico, Cuba, Porto Rico, Guam the Philippines, and the Hawaiian Islands, \$2.00, Canada, \$2.50, payable strictly in advance. Single copies, 25 cents. Remittances at risk of subscriber, unless by registered letter, or by draft, check, express or post-office order, payable to the order of THE TRADE NEWS PUBLISHING CO.

For advertising rates, apply to the Publishers. Advertisements must be acceptable in every respect. Copy for new advertisements must be received by the 25th of the preceding month, and requests to alter or discontinue advertisements must be received before the 15th day of the preceding month to insure attention in the following number. All communications must be accompanied by the full name and address of writer.

FOREIGN REPRESENTATIVES:

FRANCE—L. Dupont, publisher of *Le Guide des Carrossiers*, 78 Rue Boissiere, Paris. Subscription price, 15 francs, postpaid.

GERMANY—Gustave Mieser, Bohn a Rh. Subscription price, 12 marks, postpaid.

ENGLAND—Thomas Mattison, "Floriana," Hillside avenue, Bitterne Park Southampton. Subscription price, 12 shillings, postpaid.

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Placing the Responsibility

If you ask a man to point out the prospects of and for business progress in the future, you will probably receive as a reply that "conditions are such that it isn't wise for any of us to predict what the future will bring forth." This may prove to be the case in many lines, though it is plainly evident that business now is wide awake and is beginning to comprehend more clearly the situation we find ourselves in today. Every straw that will give any indication of which way the wind blows, is closely watched. Vigilance should be a byword now.

Such thoughts lead one to the conclusion that there is a reason and a direct responsibility for an unusual and depressed condition in the carriage building industry. During the C. B. N. A. convention at Cleveland, last month, a number of men stepped out and give it as their opinion and conclusion that the builders of buggies are themselves primarily responsible for the present status of the business. In most cases where a decline in sales is evident and the future has a dubious look, there are

very likely ample grounds on which to base such an opinion.

It has been stated that buggy salesmen have failed to put forth the usual effort in disposing of these vehicles; that they have simply sat down and allowed the automobile people to enjoy a free, open field. This may or may not be true. The only persons qualified to give a decisive answer are the buggy salesmen themselves.

Statements of this sort, coupled with a knowledge of the past year's events, will probably enable many in the trade to so analyze conditions that they may place the real responsibility for their present situation. It is not our desire nor purpose to place the blame upon anyone, but rather to aid in pointing the way to a more satisfactory and generally prosperous course.

We do not pretend to possess any guaranteed remedy for existing ailments, nor to furnish any specific formula for future success and prosperity. Our desire is to bring home to the trade the importance of persistent enthusiasm. Enthusiasm is a wonderful force for driving business ahead. Seldom, if ever, does it start anything backward. If any of you are realizing that you have been sliding backward the past year, try putting an increase of enthusiasm into your selling staff. And keep it up. The old saying, "Enthusiasm is energy on fire," may well be written here. The energy you no doubt already possess. Bring it out; set fire to it, and you will profit by the result. That's good, but it won't suffice to produce all that is desired. You've got to feed the flames. Keep the fire burning, so to speak.

One method of keeping up enthusiasm is to advertise. There's considerable difference in advertising, too. Some of it is simply general publicity, which, though valuable for a particular purpose, should not be confused with an intensive, instructive and forceful advertising campaign. Profitable advertising, as a rule, costs more than publicity. But it pays. To keep alive enthusiasm over your product you must point out in an unmistakable way the advantages it offers the owner or dealer. Buggies are not bought and sold merely because they are buggies, but because they offer advantages over any other type of wheeled vehicle. It is clearly up to the maker to see to it that such facts are never lost sight of by the dealer or prospective customer.

Our Opportunity

That the United States is today facing a commercial situation full of unprecedented possibilities, and one holding inducements for our manufacturers that point the

way toward the building of a permanent foreign trade, with the resulting benefits to the business of the country at large, is admitted by those intimately acquainted with the situation at this time.

Without doubt the most promising field for present and future development is that of the South American countries. These countries are rich in natural resources, as is perhaps generally well known. They are populated by an ambitious and industrious people and, at the present time, as a consequence of the European struggle, are forced to enter our markets for goods usually supplied by European houses. The occasion offers an opportunity for us to take hold and lift our industries to the position they rightfully deserve in the commercial life of the nations.

Much of our future business prosperity and stability is dependent on the methods and practices of our exporters at this time. Too much can not be said in favor of our manufacturers putting forth every effort possible, with the aim of securing for our country and our industries the desired goal in the commercial game.

The start has been made and it behooves our "business engineers" to see that the machinery set in motion is kept running. In other words, our industrial leaders must wake up. They must recognize their opportunity, and their responsibility to the interests they serve, and the welfare of the country at large. They must put their shoulders to the wheel, and strive without ceasing to assist the progress of the movement which has already been started in behalf of our foreign trade expansion.

One of the leading papers in the Argentine, *La Nacion*, says in regard to the North American commercial policy, that this is the moment to introduce methods which will perpetuate markets occupied by force of circumstance, for by failure to do so these will be irretrievably lost, and the American business will be reduced to a point that is scarcely perceptible.

There are now a number of American bank branches located in the South American countries and much valuable information has been gathered. Our manufacturers should take advantage of these facts and make an intelligent effort to secure a hold on these promising markets, a hold that may not be shaken off.

A Word of Commendation

We are glad of the opportunity to say a word of commendation for the recent action of the Studebaker Corporation, of South Bend, Ind. We refer to the establishment of a training school for the purpose of assisting the young men employees of the corporation to avail themselves of an opportunity of taking a commercial, technical, or mechanical course of study.

This is a work that should prove of more than reciprocal benefit and we look to see other large industries take similar action, whenever suitable methods can be adopted to successfully carry out such a project. Details of the Studebaker plan will be found elsewhere in this issue of *The Hub*. The plan is one which might prove of value to others contemplating some similar action.

DEALERS' CONVENTION DATES

Convention dates thus far announced by the retail implement organizations are as follows:

National Federation of Implement and Vehicle Dealers' Associations, at Hotel Sherman, Chicago October 13, 14 and 15.

Tri-State Vehicle and Implement Dealers' Association, at Cincinnati, O., October 26, 27 and 28. Show in connection opens October 25.

Michigan Implement and Vehicle Dealers' Association, at Kalamazoo, Mich., November 9, 10 and 11. Show in connection open in the mornings.

Iowa Implement Dealers' Association, at Cedar Rapids, Ia., November 30, December 1, 2 and 3. Show in connection on same dates.

Oklahoma Hardware and Implement Association, at Oklahoma City, Okla., December 7, 8 and 9.

South Dakota Implement Dealers' Association, at Sioux Falls, S. D., December 7, 8 and 9.

Illinois Implement and Vehicle Dealers' Association, at Peoria, Ill., December 8 and 9.

Wisconsin Implement and Vehicle Association, at Milwaukee, Wis., December 15, 16 and 17. Show in connection on same dates.

Western Retail Implement, Vehicle and Hardware Association, at Kansas City, Mo., January 11, 12 and 13.

Minnesota Implement Dealers' Association, at Minneapolis, Minn., January 11, 12 and 13.

Pacific Northwest Hardware and Implement Association, at Spokane, Wash., January 19, 20 and 21, 1916.

North Dakota Implement Dealers' Association, at Fargo, N. D., January 25, 26 and 27. Show in connection on same dates.

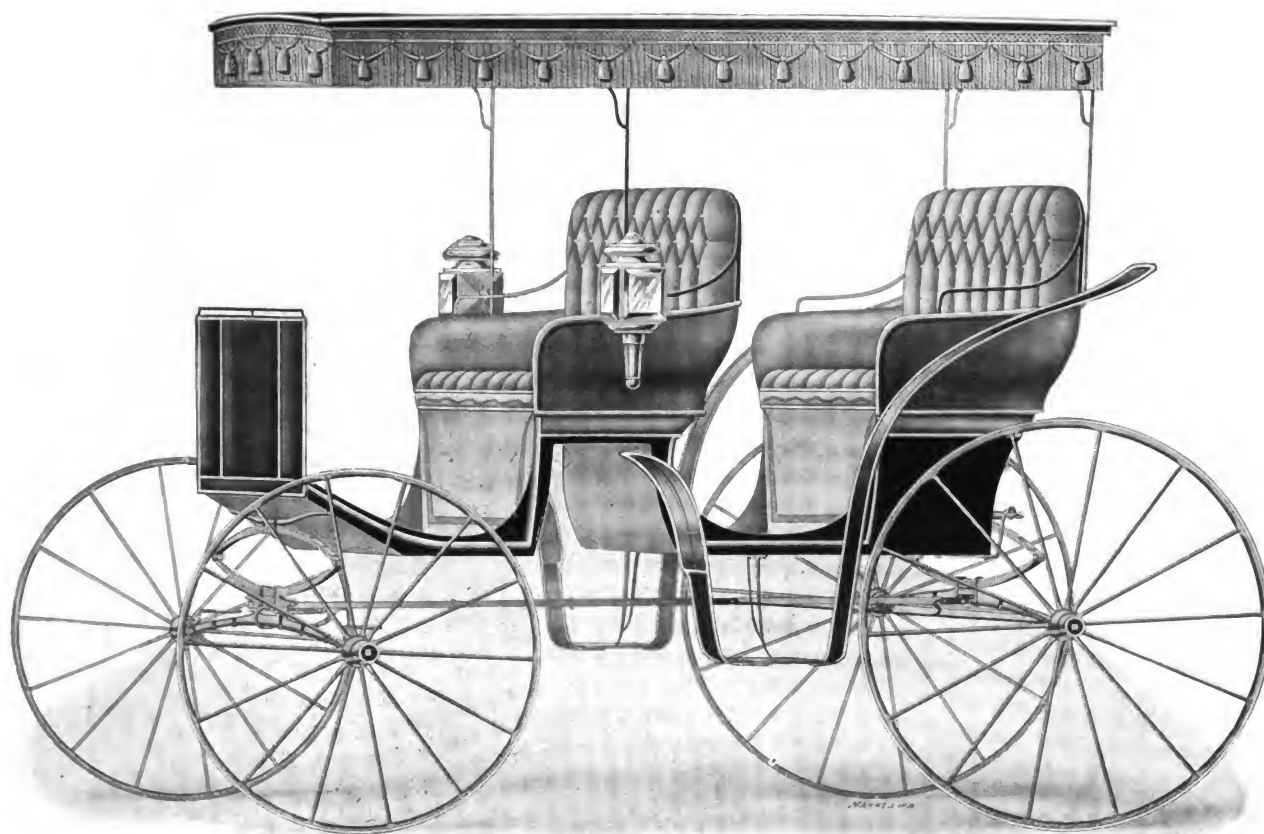
Oregon Hardware and Implement Dealers' Association, at Portland, Ore., January 25, 26 and 27.

ENGLAND IMPOSES DUTY ON AUTOS AND PARTS—FRANCE TO FOLLOW SUIT

Great Britain has imposed sundry import duties including one of 33 1/3 per cent. on automobiles and automobile parts. So far Great Britain has been the best automobile customer of the United States overseas, much the best customer in fact, and lately the British demand has exceeded all former vigor. Owing to the war the British automobile trade has been utterly tied up, making cars or other things solely to government order with no output for the private consumer, and this has sent the British dealers flocking to our shores, seeking cars for private customers and also for semi-war purposes. The chancellor of the exchequer has since proposed to waive the duty on motor trucks and parts thereof used solely for industrial purposes.

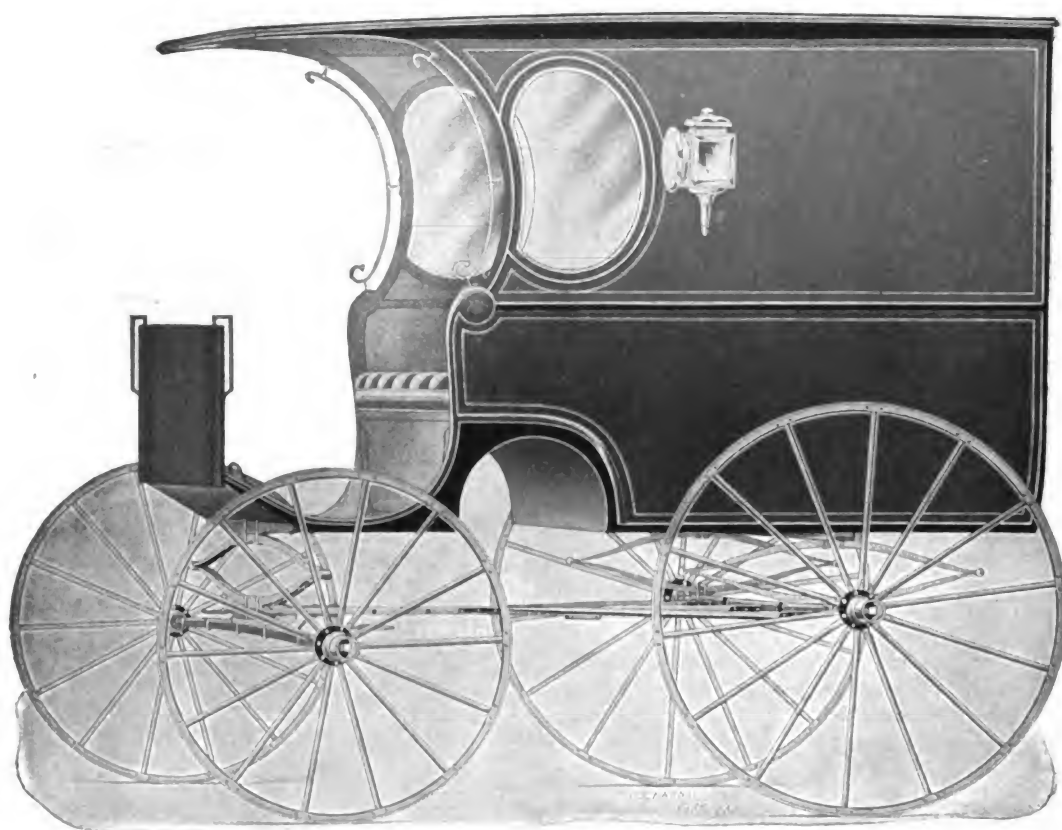
It is also declared that France will shortly follow the lead set by England, by declaring a duty of 45 per cent. on all American cars sold into France or its possessions. This new move is looked upon as a protection measure of the French automobile manufacturers against the American industry and also as a source of revenue. America has a tax of 45 per cent. on French automobile imported costing over \$2,000 and of 30 per cent. under \$2,000. The present action of France exactly reverses the situation. At present the duty on American cars entering France is 75 francs per 100 kilos, or \$15 for every 220 pounds. On a car weighing 3,000 lbs. the duty is \$225. On the 45 per cent. basis this duty will be nearly \$700, or more than three times what it is at present. This duty will not affect war orders of trucks or automobiles, but will have a serious effect on American manufacturers retaining agencies in France.

Heretofore England, which has been the greatest purchaser of American cars, has been a free trade country, requiring no duty whatever on American cars entering the British Isles. The present duty of 33 1/3 per cent. entirely changes the aspect of American makers so far as export business is concerned.



EXTENSION TOP CUT-UNDER SURREY

Manufactured by
LUTH CARRIAGE CO.,
Cincinnati, O.



FANCY PARCEL WAGON
Manufactured by
MARTIN CARRIAGE WORKS,
York, Pa.

Forty-third Annual Convention of the CARRIAGE BUILDERS' NATIONAL ASSOCIATION Cleveland, Ohio, September 21-23, 1915

The forty-third annual convention of the Carriage Builders' National Association was called to order at 10:30 a. m. on Tuesday, September 21, by President Wrenn, of Norfolk, Va., in Centarl Armory, Cleveland, O.

Harry B. Cooley, Director of Public Welfare, made the welcoming address, which was responded to by Thos. M. Sechler, of Moline Ill. In closing his remarks Mr. Sechler said:

Your reference to the large quantity of water that you have to offer every one has made it clear to me why, when the committee from Cleveland extended to us the invitation to meet here this year, they announced that they were going to give us good water to drink—I understand now why it was.

President Wrenn then delivered his opening address, which, in part, follows:

ADDRESS OF PRESIDENT C. O. WRENN

What is the future of the vehicle business? We all know that the day of high priced vehicles is gone, and that some time ago. But the medium priced vehicle, gentlemen, is here to stay. The question is, when will it open up? How long will it be before we are again enjoying normal business? The newspapers tell us that the country is prosperous, that we have bumper crops, at good prices, the banks are full of money and that, as my predecessor, Mr. Roninger predicted in his address of last year, New York is now the financial center, and that the good old American dollar is now the world's standard. But why has there been no marked improvement in the vehicle business? My candid opinion is that the consumer is not buying on prospects, and that the business will not begin again until the vehicle users get hold of the actual money. I firmly believe the business is coming back, and that we of the vehicle industry will have business from the small farmers and the tenant farmers for many years to come, and these people have been the backbone of the medium priced business for some years past.

Now, gentlemen, those vehicles sold 12 months and more ago cannot last forever. I contend that the class of persons buying the medium priced buggy is not a prospective automobile buyer, and will not be for many years to come. When this class gets the money, then business will awaken and the large majority of our factories will be humming with capacity business.

I wrote to some of my friends in Georgia and South Carolina to get some views on the subject from further south. The following letter was received from C. P. Heindel, Charlotte, N. C., commissioner of The Vehicle League:

"The writer has personally delayed answering your letter of the 8th in order to secure the views of business men who are in touch with the condition of affairs throughout the south, and, while we have been unable to arrive at any definite conclusion, the consensus of opinion is that the south should be more prosperous this year than at any time during the past three years, and just at present the most interesting development has been the practical solution of the financial problem designed to aid the southern farmer in holding his staple or selling it gradually as the demands of the situation require. You will readily see, therefore, that if this policy is strictly carried out there should be plenty of money in circulation throughout the south for everyone.

"Now in regard to the prospects for buggy business this fall, the writer already notices a great number of orders being placed though these are small, ranging from \$150 to \$300, still it indicates that the stocks of dealers are depleted and undoubtedly orders on a larger scale can be expected this fall and in the spring.

"In this connection I desire to add that it seems to me the buggy people, instead of getting out and hustling for business, they have simply laid down and allowed the auto industry to

jump all over them. If the buggy people would use only a small per cent. of the energy and aggressiveness that has made the auto industry is successful we might now all be working overtime to fill our orders. It is not yet too late, of course, to begin a definite campaign for business but before this can be secured I think that a decided and radical change is necessary in both our selling and manufacturing methods."

I really believe that we are going to have a good year in 1916. That seems to be the feeling, and I think in our business we are going to be busy, and I hope that you all will be. We want you to come down and help us sell buggies.

We next have on our program a talk by Mr. Adrian D. Joyce. He was to have been with us at our Atlantic City meeting, and we are glad to welcome him at this time.

[Mr. Joyce's address will be found elsewhere in this issue of The Hub.]

President Wrenn: Nominations for president are now in order, and I will call on Mr. Luth.

Mr. Theo. Luth: It gives me great pleasure to be called upon to nominate a man for president of our association for the coming year. He is a gentleman of whom we are all proud; he is one of the hard workers in the trade, and a very successful carriage manufacturer. He belong to an element of carriage manufacturers somewhat different from the originators of the C. B. N. A., in the old days when carriage makers had nothing to do with the jobbers and the manufacturers of implements; but the time has come when we must recognize the fact that there are some very large manufacturers of buggies in the west, who build a very large number of them, plows and implements and such as that in their factories, and gentlemen, it gives me great pleasure to name for president for the ensuing year, Mr. Phillip Ebrenz, of St. Louis.

Mr. W. H. Roninger seconded the nomination of Mr. Ebrenz.

President Wrenn: If there are no further nominations, I will declare nominations for president closed. Mr. Ware, we will next have your report.

The report, in part, is as follows:

REPORT OF VEHICLE TRADE PRESS COMMITTEE

The Trade Press Committee appointed at last year's convention takes pleasure in making a report of substantial progress along the lines for which the committee was appointed.

If the purpose of the press committee was to make the horse-drawn vehicle industry better known to the public and to bring the vehicle to the attention of that public through the medium of newspapers and magazines, then your committee feels that, with the appropriation available, they have very well succeeded in accomplishing this object.

At the meeting of the executive committee of the C. B. N. A., last November, a plan was presented and accepted through which it is believed a large amount of space in the newspapers could be secured for vehicle publicity at a very small cost. For the furtherance of this plan, the executive committee appropriated the sum of \$1,800, to be used at the discretion of the press committee, subject to the approval of your secretary.

Without going into the details of the plan by which this publicity was secured, the committee points with considerable gratification to the extensive exhibit of newspaper and magazine clippings made at this convention—all of the clippings being reproductions of the articles on horse-drawn vehicles originating with your press committee, and sent out under the arrangements outlined to the executive committee at their November meeting.

Altogether there were gathered by the press clipping bureaus and returned to your committee, 1,007 newspaper articles, which, if pasted end to end, would make a strip 7,400 inches long. This is equal to 370 columns of newspaper length.

Although the committee performed some preliminary work, previous to the first of the year, it was not until the beginning of January that the committee began to draw upon its appropriation ending August 30 with a total of \$934.60 expended, leaving a balance of appropriation to be used of \$865.40.

The result of the press committee's work compared with the nominal expenditure has convinced the members of the committee that if the work in 1916 could be continued and carried on with a special fund from the Carriage Builders' National Association, and from some of the larger manufacturers of vehicles, that from \$20,000 to \$25,000 could profitably be expended.

Such a sum would give the horse-drawn vehicle its proper position in the news columns of all the county seat papers, especially in the sections where the vehicle field is most promising.

After nine months of effort with the results we have to show you, the committee feels that it could do more than proportionately better with a larger appropriation. With from \$20,000 to \$25,000, the committee, under the supervision of your executive committee, could also reach a larger number of the strictly rural papers, the farm papers, implement, harness and horse breeding magazines, as well as all of those large city papers that carry regular departments for agriculture.

A liberal appropriation from the C. B. N. A. and from the larger carriage manufacturers would enable the press committee to keep the horse-drawn vehicle before the public in season and out of season and make our industry so prominent in the public print that people will never have a chance to forget that the carriage is still on top of the earth.

The committee further believes that concentrated action along the same lines as pursued last year, but on a larger scale, will bring horse-drawn vehicles before the farmers and the general public to an extent never before accomplished, and the results will have a telling effect in increasing the pleasure carriage output in the country. The time has arrived when the carriage builders must take a strong, progressive stand in boosting the horse-drawn vehicle through a centralized publicity campaign—such a campaign as has met with success proportionate to the amount of money available for its use in the year just past.

VEHICLE TRADE PRESS COMMITTEE.

A. M. Ware, Chairman.

President Wrenn then announced the appointment of committees as follows:

Committee on Resolutions—Frank Delker, O. B. Bannister, Gustav Schaeffer.

Committee to Recommend Officers—Theo Luth, W. H. Roninger, Clen Perrine, John Craft, John Delker.

Committee on the Exhibition—O. E. Walker, Clarence Rennekamp, O. A. Timberlake.

Obituary Committee—J. F. Taylor, J. Frank Hutcheson, A. M. Ware.

Mr. Bannister announced that the report of the statistical committee had been printed and copies could be secured at the door.

A male quartette entertained the meeting with several well rendered selections.

The meeting adjourned until the next morning, Wednesday, September 22, at 10 o'clock.

SECOND DAY, WEDNESDAY, SEPTEMBER 22

The convention was called to order by President Wrenn.

President Wrenn: We have with us for our first address Mr. G. Arthur Bell, of the Bureau of Animal Industry, Washington. Mr. Bell has made this trip from Washington here for the special purpose of giving us this address. Mr. Bell.

[Mr. Bell's address will be found elsewhere in this issue of *The Hub*.]

President Wrenn: We have next the report of the Committee on Dealers' Associations. As Mr. Staver, the chairman, is not present, Mr. Roninger will read the report.

REPORT OF COMMITTEE ON DEALERS' ASSOCIATIONS

Pursuant to an invitation of the National Federation of Retail Implement and Vehicle Dealers' Association, the executive committee of the Carriage Builders' National Association, at a meet-



Group of Those in Attendance at the Forty-third Annual Convention of the

ing held in New York, November 13, 1914 appointed a committee consisting of Messrs. H. B. Staver, J. D. Dort, W. H. Roninger, P. E. Ebrenz and Charles C. Hull.

This committee was to meet a committee of the Federation, composed of Messrs. P. T. Rathbun, T. G. Wiles and E. P. Armknecht, for the purpose of discovering whether a warranty, satisfactory to both manufacturers and dealers, could be agreed upon.

The joint committee met in Kansas City, Mo., January 13, 1915. After a full day's conference, during which the best of cordial feeling prevailed, the parties unanimously approved the form of warranty enclosed.

This warranty has since been submitted to the C. B. N. A. executive committee and the governing board of the federation and approved by both. It is now submitted to you for your consideration.

Possibly nine-tenths of the friction occurring between the manufacturer and dealer is caused by a misunderstanding of the scope of the warranty. All parties believe the adoption of the proposed warranty as the uniform warranty by all manufacturers, will minimize this friction, and we recommend to all vehicle manufacturers its adoption and its approval by this association.

Yours sincerely,

COMMITTEE ON DEALERS' ASSOCIATIONS.

H. B. Staver, Chairman.

Mr. Roninger read the warranty, and said he hoped that the association would approve it, because the Federation has already accepted it.

[See warranty on page 10].

On motion, the report of the committee and its recommendation of warranty, was adopted.

Mr. Sechler: Mr. President, there is just one weak point in that warranty, which has existed in all warranties we have ever had, and it is this: This warranty for making good stands for one year from the date of sale. Now, there is hardly a year that we have not been up against this proposition: the dealer will contend that that should be for one year from the date of sale by him. I think if the words had been put in that

by the committee, "one year from date of sale by the manufacturer," that would have cut off any ground for quibbling.

Mr. Roninger: Well, in answer to Mr. Sechler, I will say that that sounds very good and it is very nice, but we did not have everything to say. The dealer that buys these vehicles will want to say something about it, too, and we simply struck a sort of a compromise in that respect. We worked on that a full day, and the warranty which the Federation had gotten up was altogether different from this one, and so we sort of struck up a happy medium along about five o'clock in the evening. We were both glad to come to that one conclusion there at that time, and I do not believe there will be anything very much out of the way. I don't think it will be the intention of dealers generally to take advantage of that. And it is not a good thing for the carriage maker or the manufacturer to allow a dealer to keep a buggy on his floor a year or two. If he has got good salesmen out on the road, he will see to it that his dealer does not hold the buggy over a year or two before he sells it. If he is a good live man, he will try to help sell it himself.

President Wrenn: We now have the report of the Committee on a Standard Buggy. We have shown here the seat and top of the buggy which we are going to have as a standard some day. Mr. Sayers will present the report.

REPORT OF THE C. B. N. A. COMMITTEE ON STANDARDIZATION

At the meeting of the C. B. N. A. executive committee in New York, it was suggested to bring up something that would be of value to our members. Standardizing a buggy was one of the subjects that was brought up at the last executive meeting held in New York City, and your committee was appointed to begin on a buggy seat with three-bow top for a starter. The result of the meetings of this committee was to bring out a standard plain buggy seat, with standard seat irons, rail, joints, etc.

From all information furnished by carriage builders and body



Vehicle Warranty

We warrant each new vehicle manufactured by us, to be as represented when used as a private vehicle, to be free from defect in material and workmanship under normal use and service, our obligation under this warranty being limited to making good at our factory any part or parts thereof which shall within one year from date of sale, be returned to us with transportation charges prepaid and which our examination shall disclose to our satisfaction to have been thus defective; this warranty being expressly in lieu of all other warranties expressed or implied and of all other obligation or liabilities on our part, and we neither assume nor authorize any other person to assume for us any other liability in connection with the sale of our vehicles.

This warranty applies to wheels only when the owner keeps the tires tight; nor do we warrant rubber-tired wheels against taking an excessive dish.

Nothing in this warranty shall render us liable to make good any damage to paint or varnish resulting from the action of ammonia or extraordinary exposure to the elements.

We will not be responsible for any repair bills unless authorized by us in writing.

In consideration of this warranty the purchaser agrees to give the vehicle fair use and reasonable care, and to make no claims for replacements resulting from accident, negligence or abuse; or in case he shall fail to keep his part of his purchase agreement. He also agrees to report to selling agent claims for defects within thirty days of discovery.

Vehicle Warranty recommended by joint committee representing the Carriage Builders' National Association and the National Federation of Implement and Vehicle Dealers' Associations, at conference held in Kansas City, Mo., January 13, 1915

builders from St. Louis, Columbus, Cincinnati and elsewhere the committee got up a light buggy seat, which was thought a popular style to fill the requirements of the trade in territory where light buggy seats are wanted. On this seat standard seat irons were used.

While automobile style seats may predominate in certain territory, there are sections where plain buggy seats are universally used and the committee feel that the style selected will suit this trade, in fact, several manufacturers have already expressed a willingness to adopt this seat as a standard.

As the majority of the trade demand a long top, the committee settled on a 48 in. top; however, if a shorter top is desired, all that is necessary is to shorten the length of the goose neck and use different dimension joints.

Dimensions of this standard top will be furnished by the secretary or at the exhibit.

Every builder knows the advantages of standardizing the parts of a vehicle, and we mention some of the points in its favor:

- 1—It enables the builder to carry less stock, which means less capital and less expenses.
- 2—It enables the manufacturer to obtain material quicker; as an illustration, the bow socket manufacturer can arrange to ship standard 29 in. sockets the same day order is received, otherwise when special lengths are ordered you will have to wait until the stock is made up.
- 3—It increases your output.
- 4—By making standard work, the output comes nearer to perfection.
- 5—Stock can be obtained from other manufacturers, or other factories will take surplus stock in case of overstock. It often happens on special patterns of your own, you accumulate an overstock, and all they are worth is scrap when changes are made.
- 6—Standardizing does not mean that you have to depart from any individual features of your own, the idea is to standardize on dimensions and continue to build your own grade. This does not prevent you from changing the shape where it does not interfere with other standardized parts used in the construction. For instance, the long joint on the top shown at convention is straight; some manufacturers might want them offset at the ends, or even curved joints, but the distance between holes would be the same on either straight or curved joints if the standard was adopted.

While there have been some results obtained by standardizing, we believe much more could be accomplished if carriage builders will give their support, and the time is propitious to act and take advantage of the opportunity of standardizing our product, the same as is being done by other successful industries. Every carriage builder that we have interviewed on this subject has expressed himself as being in favor of standardizing.

No industry has been benefitted more by standardization than the automobile industry. We refer to the Society of Automobile Engineers, they have standardized the truck wheel. Formerly when a manufacturer bought a truck wheel and delivered

it to the tire men to have that particular tire put on, he had to rebuild the wheel to fit his tire; later on, if the owner decided to put on a different make of tire and delivered it to the other tire concern, they would have to rebuild the wheel to fit their tire, etc. Now then, the Society of Automobile Engineers have standardized that wheel and have compelled the tire people to standardize their tire. Now, if a wheel goes to the tire men, the wheel is ready for their tire and the tire is ready for the wheel; no change. We merely bring this up to show the interest the automobile manufacturers have taken to standardize. In order to have a full attendance at their meetings they chartered a boat, and kept away from land for four or five days in order to hold the members right at the meetings.

It is the belief of your committee that standardizing is of vital importance to the entire carriage industry, and it is earnestly hoped that our members will support the plan and take advantage of the time and energy which your committee devoted in getting up this data. It is surprising what you can do if you will start out with the proper determination to do a thing, and if standardization is a good thing, which we believe all admit, then let's get busy and start right now when vehicle stocks are at a minimum and make plans to get together and standardize our product.

COMMITTEE ON STANDARDIZATION.

W. A. Sayers, Chairman.

Points About Standardized Goods

- 1—Using standardized goods is a good advertisement and makes satisfied customers.
- 2—Standardizing this plain seat will lead to standardizing other styles, and eventually a complete job.
- 3—It has been attempted on several occasions to standardize width of tracks, but no results have been accomplished, but there is one thing that can be done regarding tracks and that is to standardize the width of shafts, so as to make one width shaft for all purposes. On the 4 ft. 4 in. track it has been necessary to use a narrower width shaft, but by making the 4 ft. 4 in. track one inch wider the standard width shaft can be used, thereby making one width shaft for all width of tracks.

This is an advantage to both dealer and manufacturer, as it is necessary for both to carry only one width shaft, and when you consider the different couplings used on shafts, viz., plain eyes, Bradley, Standard, etc., you can see how this one item helps your factory. This is not a theory, but has been in actual practice by one carriage builder for years. This is a pointer that you might as well take advantage of.

The committee feels that unless there are results from the

work they have done, nothing has been accomplished; therefore to make a success of our efforts, which are for the benefit of this association and to produce results, the carriage builders of this association should place order at once for a simple seat and back ironed with shifting rail and have the same painted and trimmed, then put it on a complete buggy to see if it measures up to what they expect.

The committee are ready to take orders at the display. We want every one that is interested to give their order before leaving Cleveland. The price of seat will be 10 per cent. over actual cost and the complete seat, back and rail will probably not cost over \$2.50 (not including bows or sockets). The price will be satisfactory. These seats will be made by a first class body builder and will be equal to the same seat on exhibition. The seat can be furnished with detachable back so back can be painted before it is trimmed, which is the manner some manufacturers handle these seats in the factory.

All necessary data in regard to stock number of irons will be furnished those ordering sample seat.

Mr. Roninger: Mr. President, as I understand it, this standardizing is all according to size, and all that any carriage manufacturer has to do is to go to the committee and get the size, and he can buy these joints, seats, bodies, or whatever he wants, from his regular manufacturer, without specifying here any particular manufacturer.

President Wrenn: The size is already published?

Mr. Sayers: Yes.

President Wrenn: I am going to call on some of our members now to give us short talks on the business situation, and I will call first on Mr. Adams.

Mr. C. E. Adams: I suppose the thing you are interested in is the carriage business. I am glad you shut off Mr. Sayers on this standard buggy talk, because he told me a little while ago he wanted me to say something about the standard buggy, and when I got here I found he had fixed the buggy up, and Mr. Chapman took me up here yesterday and showed me that buggy and says "Charley, that is Mr. Sayers standard buggy." I said, "Oh, yes." And he said, "See those irons on this top? We make all those. (Laughter.) We have been making them for about 20 years," so if you want to get any of those irons for that standard buggy why, of course, the Bradford Mfg. Co. is still doing business at the same old stand. A few minutes later a very aggressive competitor of ours came up to me and said, "I want to show you the standard buggy of Mr. Sayers. You notice those bolt sockets and joints and rails and irons there?" "Why, yes," I said. "Well," he said, "we make those." And so I will just tell you now, you can get the irons from Crandal, Stone & Co., and the malleables from Chapman, of the Bradford Mfg. Co. (Laughter.)

I listened to the gentleman from Washington, about the 24,000,000 horses. I had been all over that, as I had a copy of the report from Washington, and when I read about there being 100,000,000 horses in the world and 24,000,000 in America, I thought to myself, 'This is where the buggy business comes back, or else there is something wrong with us because those 24,000,000 horses are not doing what I think they ought to do.' I made up my mind that those 24,000,000 horses have been too quiet. I think what we want now in the carriage industry more than good roads is something with which we can inoculate these horses. I think we want more kickers among them. I would like to get more of a kangaroo horse if I could; something that every time it moved along it would smash the buggy to pieces. That is what we want. We don't want such gentle horses. I don't understand about those 4,000,000 mules. I did not realize that there were 4,000,000 mules, or I might recommend our boys to recommend to their customers that they sell more buggies to the men who own mules.

So far as the business situation is concerned, I suppose that every one of us, no matter whether we are carriage manufacturers or whether we are in the accessory parts line, the thing that really interests us is to know what is ahead of us. It is a marvelous thing that our carriage industry has gone through this year or more now that this war has been in progress and that has caused business paralysis in this country to such an extent, and yet the carriage industry has stood it, and there have been very few failures. Carriage men have paid what they owed, and they have kept their plants from the sheriff, and the sheriff isn't going to get them, and I feel more proud of the carriage industry today than I ever did in my life.

What is in the future, how far the automobile is going to cut into its field and take its place, that is something which you

perhaps know more about than I do. I was born an optimist, and I never was more of an optimist than I am today. I think there is business for every single one of us, and I think there will be business for our children and for our grandchildren, and all they need is what has made a success of you men, and that is energy and ambition, and if you have got that and you are willing to work hard, there is just as much of a chance to be successful as ever.

In the business outlook, we of course, in our line generally look at the steel market. We believe that there is going to be a scarcity of material, especially if this war lasts. I have friends here who are planning on this being a five to ten year war, and they are buying machinery on that basis and are building buildings and taking orders on that basis. Now, what has happened in the steel business? We had pretty dull times in the steel business. In the rolling mills and blast furnaces they were running 25, 30 and 40 per cent. capacity. The railroads are not taking what they were. We had always supposed in this country in the steel business the whole thing depended on the railroads, that the railroads took their 50 to 60 per cent.



**The New President
P. E. EBRENZ
St. Louis, Mo.**

of the output of the mills in this country, and when the railroads were busy they were having pretty good times in the steel business, and if the railroads were not taking their 50 to 60 per cent., then business was not good. And that pretty nearly happened to be the case, when the railroads had to economize, and we found the mills running from 25 to 30 per cent. their normal capacity. Now, what is the situation today? The railroads are buying no more than they were. There is not a steel mill of any kind in the United States that has not got all the work it can do for months ahead. A mill here in this town took an order the other day for 7,500 tons for 3 1/4 inch rounds at three cents a pound net at the mill. Now, that is \$60 a ton, and they are rolling that on exactly the same mill that they would have been glad six months ago to have sold you that same stock, rolled on the same mill, for \$22 a ton. Not quite the same stock, as it costs them a little more, because the analysis is a little higher. They tell me it costs about \$6 a ton more than the common stuff. The Youngstown Iron &

Steel Co., one of the biggest rolling mills in this part of the country, is operating their mill on shrapnel bar. The Carnegie Steel Co. will not quote you a price on any heavy size of stock. Our boys came in the other day with an order for forge steel. We thought it was a pretty fair order.

There were 81 tons of one size in it. It was not a big size, either. It was, I think, perhaps $2\frac{1}{2} \times \frac{3}{4}$, or something like that, and we thought it was a pretty nice order, and were in a hurry to get it. The Cambria Steel Co. said that they could deliver it to us by December 1. The Republic Iron & Steel Co. told us they could deliver it about December 15, and the Carnegie Steel Co. told us that they would not promise us any delivery on it at all, because it would be after the first of the year before they could deliver it to us, and they didn't know just when they could. Finally a concern said that if we would give them \$5 a ton advance, they thought they could switch it around from one mill to the other and possibly get it to us in 60 days. Now, gentlemen, that is the steel business today. Mr. Frank Bourne, president of the Bourne-Fuller Co., one of the very largest concerns in Cleveland, said to me yesterday. "I believe by the first of February we will see the greatest shortage of steel that the United States has ever seen in its history, because our experience is that all the manufacturers and jobbers have run their stock down to a minimum." The railroads never bought as little as they are buying now, and then these enormous crops coming on, a demand is coming for the cars and they are utterly unprepared to handle them, and the railroads will come in and find that that 60 per cent. of capacity, which they have always considered as theirs and which we all in America thought was theirs because we thought that they were the only customers that could take such an enormous amount of the steel in this country—they will find that that 60 per cent. of stock has been bought up for months ahead and is going abroad. Now, I think those are things that are worth thinking about. I think we have a right to expect a shortage of everything we use. I know we do at our plant.

We have in this country today the thing that has always made a boom as long as I can remember, and that is the greatest crops that we have ever known. Coupled with that, we have the greatest demand for steel away from home. My friend Mr. Clapp told me yesterday afternoon a very significant thing. A concern in Pittsburgh from whom he buys his rods told him that they were not making any war stuff, but that they were selling abroad all the spare capacity they had of rods and wire at \$12 a ton advance over the price he was paying for it. Now, gentlemen, you can readily understand that there is going to be a great temptation on the part of those mills who are getting \$60 a ton for $3\frac{1}{2}$ round, when I suppose you are buying tires for—I don't know, but I suppose anywhere from \$25 to \$30 or \$35 a ton. And you compare a $\frac{7}{8} \times 3/16$ tire with the $3\frac{1}{2}$ in. round, the one at \$30 a ton and the other at \$60 a ton, and then imagine which you would rather make.

Now, I simply speak of this just as I see it in our business and as I said before, I never was anything but an optimist. If I were in the carriage industry I would be an optimist. I think the carriage men will do some other things besides making carriages. I think they make other things, and think they will be doing business at the old stand for many years to come.

President Wrenn: We have Mr. McCurdy with us, and our members would be very glad to hear from him for a few minutes.

Mr. W. H. McCurdy: There are two or three causes why the carriage business is so low as it has been this year. The war has had quite a direct effect on our industry. A number of our carriage manufacturers depend upon the south for a good deal of their trade. In making my estimate for the business of 1915 I hardly knew how to figure. I knew that business last year was cut off in the south, and it did not seem to me as though it were going to return during the year, and in that I didn't make any mistake. I may say that 75 per cent. of my normal business in the south was lost this year. I may say that in the balance of the country where our business is being placed, it was almost normal with us; not because the business was normal in those states, but probably due to extra efforts that we made to get business. I was talking to one of my traveling salesmen this morning who is in Ohio, and he is a pretty good man. I asked him if there were many traveling men on the road; if there were many men out selling buggies. He said, "No; I don't meet many men." I said, "What do you think the result would be if there were 20 men in the state of Ohio who were No. 1 salesmen, waiting upon the dealers, trying to sell buggies?" He said, "I would sell more goods. I know I would." Well, I asked him how he reached that conclusion. "Well," he said, "I go in to see a dealer and he has not been called on by a real salesman for some time. He has come to the conclusion that the manufacturer has made up his mind that there is no sale for buggies and so they don't send

their traveling men out. And this dealer, not having been drummed for business, it is pretty hard for one man or two men to wake him up." And right along this line, there is one thing that the carriage men are making a grave mistake in, and that is in not keeping men out, and when they have a man out he is not of the type that they should have, as a rule. I have several good salesmen, and I have several salesmen that are not very good. My business is good in every territory where I have a good man, and I may say that where I haven't a good man I don't get much business; and I change off and I put in a new man, and I know from experience that that is true. We will go along with men, maybe paying all they are worth, \$1,200 or \$1,500 a year and expenses. That kind of a man would answer the purpose very well ten years ago, when it required no particular effort to sell goods; but today, he will not do, and we had better take warning right from this date. A man that you can employ for less than \$2,500. I will say, to be modest, is a man who is not safe to represent our business and to get orders. It takes a man that is able to go to the dealer and convince him that he is losing out by not keeping buggies on his floor. Every successful merchant has a good line of goods to show his customers when they come in, and the carriage man is no exception. So the thing for the manufacturers to do is to induce the dealer to buy buggies and keep them on his floor, so that when the farmer comes in looking for a Ford or a Chevrolet or something of that kind, he can show him a buggy and say, "Here's what you want; you have got horses. Take this buggy." Convince him that it is the thing to buy. That can be done, and it is being done, but we don't give thought enough to that end of it. As one carriage man said yesterday, we can't afford to pay \$3,000 for a salesman. You can better afford to pay \$3,000 for a good salesman than you can \$1,000 for a traveling man. There is a big difference. The one will get you business, while the other will spend your money and not get any results.

O. B. Bannister: As chairman of your statistical committee, there has been given me the opportunity of knowing the views of a large number of different minds as to the future of the carriage trade, but as these views are fully set out in the report of the statistical committee, they will not be referred to here—although it is difficult to divorce your mind from the influence of so many views and give an opinion on the business outlook for the vehicle industry from a personal standpoint, as was requested by the president in his letter telling me that he would expect a five minute talk from me on that subject.

My personal viewpoint is, that the conditions brought about—

First—By the war.

Second—By the unfavorable national legislation, and I mean by this, a tariff law that has and will disturb many lines of manufacture, and

Third—By the use of automobiles, are such that it is impossible for anyone to foretell by means of present signs, the future of any business.

This does not apply to the carriage business alone—but to all lines that are affected by these conditions—and they are many.

I would regard it poor business judgment to change your business for these reasons only, provided one can hold on until the storm is over. The war will not last forever—and we have a way in America of changing administrations, and the change will be due next year.

With these two things out of the way, it may develop that there will be no place for the horse-drawn vehicle, but I do not believe it. I believe that there will always be a demand for carriages and buggies—not so many as there has been heretofore, but a greater demand than there has been during the past twelve months, and our actions will be controlled by this belief. We expect to be making horse-drawn vehicles for many years to come.

The carriage business has been hit hard, very hard. In our judgment, it has been hit almost as hard by the neglect of the people that are in it as by any other condition. We are not going out in the "highways and byways and compelling them to come in."

If a good merchant has a slow seller, he makes greater efforts to move it. As I see it, this is one of the great troubles with the buggy business. It was an easy seller. Conditions have changed. It is now a poor seller and calls for greater effort—but the facts are, as we see them, is that less effort is being made to sell than heretofore.

Hesitation—Fear—never accomplished anything.

Courage—Progress—is insurmountable.

Mr. Roninger: There is no doubt that all business has been very poor. The carriage business doesn't stand alone in that. Every other line of business is about the same. I have done some traveling in the last three or four months, and I find that all lines of business have been very poor excepting those manufacturers that are making munitions of war. The crops

throughout the United States have never been better. I have never seen anything like it. The farmers are well to do, and they have got tremendous crops, and they are going to have plenty of money. I firmly believe that the buggy business is not a dead issue, as some would have you think. You hear people talk here in private conversation about this convention, "Well, will there be anybody there? Is there going to be any interest displayed?" Well now, it seems to me that there has been quite a good deal of interest displayed. More so than I have seen at any convention for the last two or three years. There are more people attending this convention than we have had for several years, and so it shows an interest in the industry. Somebody is waking up.

One of the great features that I have found, and one of the great effects I might say throughout the country—and I made it my business to stop off and speak to people and inquire about the general conditions—the dealers that had heretofore been handling quite a stock of vehicles were kind of relegating them to the rear. They had lost heart. Some people said there weren't very many traveling men out representing the vehicle industries, and where I saw vehicles, as a general thing they were in the back end of the store and they were all covered with dust, and they were not very well taken care of. Mr. McCurdy hit the right idea when he spoke about salaries. Today you have to hire brains, and you can't get them for a few paltry dollars. Now, I have talked to a great many farmers throughout the country, and they all agreed that they want buggies. I didn't hear any farmer say he didn't want any buggy. Of course, a great many had automobiles; but it has been a sort of pleasure—one man gets a machine, and then the other man gets a machine. Now, I am getting off onto the automobile business, but it comes in very naturally, and they soon realize that it is a very expensive proposition; we know that it is not an asset, but it is a liability. And the farmer is commencing to find out, too, and he is going to buy buggies. But the carriage manufacturer has been neglecting that. If a man has other means of conveyance, whatever it may be, he also will have to have a buggy. I never saw in all my travels so many young horses in the fields. It shows that everybody is raising them, and they are going to use them. I believe the time has come when all of you should put your shoulders to the wheels and push and instruct your traveling men what to do. I don't believe it is a good idea for a traveling man to go in and get an order for a half a dozen or dozen lot, no matter what it is, but it applies particularly to a buggy or vehicle or spring wagon, or whatever it is, without showing how to dispose of it in advertising. The time has gone by, I believe, when it is necessary to build a very cheap vehicle—that is, I mean within a dollar or two—a real low-down price buggy. The man who buys a buggy today will want a little better grade of buggy, because the other mode of conveyance is now very popular, and people have gotten used to paying pretty good prices for their pleasure, and they are going to pay a little more. As I said the other day to some friends here, I believe it would be a good idea if you would advance the price of your buggies a little, and in the little country towns of one thousand or two thousand inhabitants put a little advertisement in the paper regarding vehicles. It does not cost very much in towns of that size to put that in the paper, and I believe it to be the traveling man's duty to do that. When a man gets through selling to a dealer, I do not believe he ought to pack his grip and run for the train. I believe he ought to put in his time helping out his dealer. I believe the time has now come when you must get more enthusiasm in the traveling man. The buggy business is not dead. The crop conditions are so good that you will have no trouble in getting the farmers to buy buggies if you get right down to tacks and hustle for the business.

Mr. Gerstenslager: Mr. President, I do not want to say anything against the other speakers, but some of them would make you feel you had better go home and sell out your carriage business. It is just as Brother Roninger said: The trouble has been with the carriage manufacturers so far. They are afraid they are not going to sell any more buggies. We do not build very many carriages, being just a small concern down here at Wosster, O. We have been in business 22 years, and have always built a high grade carriage. Some of you, no doubt, know of us. Our traveling men will say: "Now, if you would build a cheaper buggy—build two grades—I could sell more." I have said, "No; we have always built a high grade buggy, and we are going to continue." This year, as you all know, the business has been dull, and there are a number of reasons for that. In the first place, I do not believe there is a man here but who would agree with me, if he has been in the buggy business for 22 years, that he has never experienced such a summer as this. I have one dealer in mind who last year sold 125 buggies, and this year sold 110. He told me he had at one time—about the middle of May—30

buggies that were sold, but not taken out on account of the mud. We do some repairing at our place, and last summer oftentimes one farmer would load up a load of wheels and drive to our factory and have the tires set while he was waiting. I do not believe that we set three sets of tires this year. We all know why it is. The old buggy stuck together and the wheels swelled up, and the farmer said, "What is the use of buying new ones?" I am not discouraged with the buggy business. We build only one grade buggy, which sells at \$66, rubber tired. We are only a small manufacturer, and we do not attempt to build more than 1,100 jobs, the most we have ever built, and this year we shipped 800, and this has been the worst year in the buggy business, on account of the weather, that we ever had. But, just as the brother said a little bit ago, it is largely the dealer's fault. I have one dealer located at Medina, O. He was an old gentleman, and he is dead now. He had a young fellow in with him. He said: "I can't sell your buggy. It is too high priced. And the last year he was in business he sold three jobs. This young fellow took up the business, and he hustled. This year he sold 37 jobs."

Mr. Luth: I believe in the buggy business. I am in it and pushing it as hard as I can. We are looking forward to better trade. Indications in the south are better, and, as you have already heard, crop conditions are good, and there is no reason why we should not have more business this coming year. Let us all do the best we can. That is Mr. Adams' slogan, and I think it is a good one.

President Wrenn: We will now call for the report of the executive committee by Mr. Ebrenz.

REPORT OF THE EXECUTIVE COMMITTEE

P. E. Ebrenz

The executive committee of the Carriage Builders' National Association in presenting their report to the forty-third annual meeting of the association, are pleased to say that our financial condition is very flattering, and the affairs of the association are very satisfactory.

Our special committee appointed to meet with the dealer's committee to frame up a new warranty for the horse-drawn vehicles met with very satisfactory results, and this matter which has been long standing is finally adjusted to the approval of the dealers as well as the manufacturers.

The Trade Press Committee have at all times throughout the year been engaged in a publicity campaign which certainly has been of much benefit to the association, and we recommend a continuance of the publicity committee which we are sure will give the public much better knowledge of the horse-drawn vehicle industry.

The Statistical Committee have spent much time on their report, which we trust will be carefully noted by our members. Our Technical School was never in a more flourishing condition and well supported by funds to carry on successful work which has already proven of great benefit to both horse-drawn and motor vehicle manufacturers.

It is the intention of the president to call on several members at this meeting to make some remarks on the general business conditions, and what best can be done for the benefit of the carriage industry. The executive committee feel this is a very important matter and sincerely hope it will have your loyal support.

Your committee recommends that we should in every legitimate way do all we can to induce the dealers to keep new buggies on their floor. Salesmanship is of more value to the buggy manufacturer than any other one thing. We should not be content with the mediocre salesman. It now requires the highest type and most aggressive representatives to convince the dealer it is to his own advantage to buy and keep on his floor a fair stock of horse-drawn vehicles.

It is the sense of your committee that the Carriage Builders' National Association recommend that while the wide-spread improvement and building of new roads is being carried on throughout the country, special provision be made to build all roads of sufficient width and character to give proper accommodation and protection to horse-drawn pleasure vehicles.

Respectfully submitted.

President Wrenn: The next is the report of the committee to recommend officers for the coming year.

REPORT OF NOMINATING COMMITTEE

Your committee to recommend officers for this convention, year of 1915-16, respectfully reports as follows:

For members of the executive committee for the term of three years: W. A. Sayers, Cincinnati, O.; W. H. McCurdy, Evansville, Ind.; J. D. Dort, Flint Mich.; C. O. Wrenn, Norfolk, Va.; Charles C. Hull, Connersville, Ind.

For secretary and treasurer: Henry C. McLearn, Mt. Vernon, N. Y.

For member board of trustees technical school: Daniel T. Wilson, New York.

For vice-presidents: John J. Delker, Henderson, Ky.; F. A. Ames, Owensboro, Ky.; A. T. Jackson, Rockford, Ill.; H. F. Cartwright, St. Louis, Mo.; C. R. Crawford, St. Louis, Mo.; Jno. D. Craft, Evansville, Ind.; A. M. Parry, Indianapolis, Ind.; E. M. Galbraith, Cincinnati, O.; Clen Perrine, Cincinnati, O.; R. H. Wilcox, Columbus, O.; August Geissel, Philadelphia, Pa.; H. A. Crawford, Kalamazoo, Mich.; L. E. Nutt, Moline, Ill.; C. S. Walker, Des Moines, Ia.; H. A. White, High Point, N. C.; Thos. B. Tyson, Carthage, N. C.; A. O. Schwartz, New Orleans, La.; W. G. Norman, Griffin, Ga.; J. R. Knight, Franklin, Va.; Geo. H. Babcock, Watertown, N. Y.; Jas. H. Birch, Jr., Burlington, N. J.; H. K. Porter, Everett, Mass.; J. W. Anderson, Rock Hill, S. C.; R. E. Weisner, Janesville, Wis.; H. Nicolaisen, Cheyenne, Wyo.; O. R. Carver, Morristown, Tenn.

THEO. LUTH, Chairman.

The nominations as reported were approved and adopted.

President Wrenn: The next business is the election of president.

Mr. McCurdy: Mr. President, I move that the secretary be authorized to cast the unanimous vote of this association for Mr. P. E. Ebrenz, of St. Louis Mo., for president.

The motion was carried, and President-elect Ebrenz was escorted to the platform.

President-elect Ebrenz: Gentlemen—I am going to keep you but a few minutes. I want to say that I appreciate being selected to head this organization for the coming year, and I am justly proud of being placed in that galaxy of men, such as Kimball, Studebaker, Babcock, Firestone, McLearn—God bless him—and others who have led this association in the years which have passed. And in later years, such men as J. D. Dort, D. M. Parry, and W. H. McCurdy. Many of the old leaders have gone to the Great Beyond, but the great work which they performed for this association stands as a monument to them.

To touch on the present situation for a moment, we will have to admit that it is a little difficult, but I believe that we, ourselves, are largely to blame in that we, on the whole, have not been aggressive and have not met the situation this past year with the determination to get the most out of it. The carriage business has always been, to my mind, more or less an easy, indolent business to quite a number engaged in it. It has been a profitable business to those who put pride and sentiment behind them and insisted upon getting a reasonable return for what they furnished and who consistently refused to give more than they received. That the easy times have gone there cannot be any doubt, and it is necessary for the carriage manufacturer to adapt himself to changed conditions, to bring himself up to date and fight for his business the same as men engaged in other lines. In years gone by, we did not give much thought, perhaps, to our periods of depression, for we felt that a prosperous time was before us, and it came. Now, however, we have other things which have an influence upon our business, things with which we have never before contended, but whether these things are going to have any marked effect remains entirely with us, I believe. We have had a hard year—the abnormal conditions in the south as Mr. McCurdy has said, and the general wet weather throughout the country, have had much to do with the situation throughout the year. Difficult situations require extra effort, new life, and it is up to us to instil this effort into us now. It is concerted effort that brings results.

Mr. Adams did not say anything directly applicable to the buggy business, but what he meant to convey was that a period of prosperity is before us and that a part of this prosperity belongs to us, and we should get it. This means salesmanship, which Mr. McCurdy covered very well indeed. It is very necessary that we get clean, bright, energetic fellows to represent this industry. I believe that with concerted effort, we will wind up this coming year satisfactory to us all.

THIRD DAY, THURSDAY, SEPTEMBER 23

The convention was called to order by President Wrenn at 10:45 a. m. He called for the report of the Statistical Committee, O. B. Bannister, chairman.

The report had been put in type and circulated during the convention, so Mr. Bannister stated that he did not think it worth while to burden the convention by reading it. Parties interested can secure a copy by writing Secretary H. C. McLearn, Mt. Vernon, N. Y., or O. B. Bannister, Muncie, Ind.

The chief causes given in the report for the shrinkage of

business were automobiles and "Fords," general business depression, the war, and the price of cotton. The report in part follows:

REPORT OF STATISTICAL COMMITTEE

The unprecedented condition affecting very nearly all manufacturing industries, that has prevailed since the first of August, 1914, should be kept in mind when comparing the figures given in this report for the period of June 30, 1914, to July 1, 1915, with previous periods.

The committee made the following requests from the carriage manufacturers in the United States:

1. What was the total number of horse-drawn vehicles (spring work) produced by you from June 30, 1914, to July 1, 1915?
2. What percentage of your normal product did you make?
3. To what do you attribute the shrinkage in product?
4. What is your opinion of the future of the carriage trade?

This request was sent to 358 companies. Responses were received from 241.

Forty-seven companies previously engaged in the manufacture of spring work reported that they had either gone out of business or discontinued the making of buggies and were turning their attention to other lines.

The committee, as a committee, will not undertake to express opinions as to the future of the carriage trade, but believing that it will be of very material interest to all carriage manufacturers, and manufacturers of accessories to the carriage trade, to know the views of the carriage manufacturers as expressed in their responses to the committee, we have decided to print these views exactly as given, except, of course, to leave off the names of the parties giving the opinions—it being understood between them and the committee that the information furnished was to be treated strictly confidential.

Following, therefore, the statistical statement will be found the answers of a large number of carriage manufacturers to questions two, three and four.

Statement

Showing number of sets of wheels, number of shafts and poles, number of sets of axles, number of buggies, carriages, spring wagons (spring work) produced:

	Wheel Sets Production January to January	Poles and Shafts Jobs Production Aug. to August	Axles Jobs Production Sept. to Sept.	Buggies, Carriages, Spring Wagons (Spring Work), Production July to July
1905	1,216,224	1,310,000	1,345,268	.....
1906	1,292,874	1,540,000	1,463,331	.....
1907	1,202,559	1,340,000	1,517,634	.....
1908	812,501	1,040,000	1,946,493	.....
1909	1,115,925	1,062,500	1,185,286	.....
1910	1,201,105	1,325,000	1,349,782	.....
1911	1,097,308	1,075,000	1,344,820	.....
1912	963,305	1,025,000	1,141,484	.....
1913	988,200	1,127,500	.....	.....
Jan., 1914, to July, 1914..	493,590	.....	.....	.....
July, 1913, to July, 1914..	.....	868,000	1,092,832	786,392
July, 1914, to July, 1915..	523,578	517,512	653,642	397,023

The total number of carriage manufacturers contributing to this information was 194.

The average percentage of normal product reported by them was 55 per cent.

The following table will show the number reported by states, and the average percentage of normal product in each state:

	Number of Jobs Reported	Average Percentage of Normal Product
Georgia	8,389	26%
Illinois	65,654	55%
Indiana	108,056	66%
Iowa	11,047	60%
Kentucky	22,857	63%
Maryland	757	60%
Massachusetts	260	28%
Michigan	25,493	63%
Minnesota	1,395	74%
Missouri	45,640	56%
New York	8,335	33%
North Carolina	11,967	28%
Ohio	55,832	59%
Pennsylvania	16,228	58%

South Carolina	1,770	20%
Tennessee	2,056	82%
Virginia	6,636	35%
Wisconsin	4,641	73%
	397,023	55%

Opinions on the future of the trade were all the way from "pessimistic" to "very bright." One reply (No. 10) is such a good sermon that we print it herewith:

"We attribute shrinkage in product to general conditions, as a matter of course, which also have created a disposition on the part of those who are associated with the buggy business, to hold back. Had the buggy salesman worked his business as hard this year as in the past with a real desire to sell the article, much better results would have been obtained. The vehicle business is suffering from indifference. That the people have money to spend is proved by the enormous business being done in automobiles, much of which might be diverted to horse-drawn vehicles, if the fight was conducted with the enthusiasm as in previous years. No battle is going to be won when a man feels he is licked before he goes into it.

"Another thing which has affected the general buggy business this year has been the attitude of the big implement houses. These concerns have been so engrossed with new things in the implement game and with problems which have sprung up this year, that they have devoted nearly all their time and energies to their direct line of implements, but those matters have apparently been settled and the implement men are in position to take up the buggy end of their business as in the past. This is bound to have a big effect, which the country dealer is going to feel when the implement salesman calls on him with a real purpose of selling him horse-drawn vehicles. Every carload of vehicles sold will mean a revival of business in that particular section.

"The answer is for everybody to get on the job. The harder the task, the more effort to use. Buggy men have been inclined to be indolent. The easy disposition of years gone by is still in evidence to some extent and if things don't go right and business is bad, we are inclined to lay down instead of buckling on our armor and making business.

"Time changes things. Conditions also change opinions. Fixed opinions get nowhere and permit of no expansion. The buggy manufacturer and dealer who nurse fixed opinions of their product based upon the past are constricted, and find the present situation difficult. Everything at times requires new effort and he who cannot put new effort, new life into himself and his product, meeting new and changed conditions, should look upon himself as a failure. There is no one worse than the discouraged individual, and the buggy has felt the effects of that disposition. The article itself is much stronger and maintains itself better than some of those people who are directly associated with it. Whoever has kept alive his interest in the buggy, built it, worked with it, studied it, sold it, has not found any reason to doubt it, and the buggy to that man today is nearly as big a proposition as ever. It is true that there is some reduction in volume, but the field is open with profit to those who are alert and who follow the game with vigor and judgment.

"We ourselves are quite sanguine as to the future of the carriage business."

The committee then goes on to say:

These opinions come from men that are engaged in the vehicle business throughout the United States—they are not confined to any one locality.

We desire to call particular attention to the views given in item No. 10 and item No. 25 admitting that there are conditions that have and that will continue to cause the vehicle industry to shrink.

Are the people engaged in it doing all they can to prevent it, or are they "inclined to be indolent" as one of your number says?

We fear that the latter is nearer the truth than many will care to admit. We believe that it is at least safe to say that an aggressive progressive selling policy is not generally observed.

How many carriage manufacturers are there that know the number of people living in each county of the United States, and how many of them are prospects with whom a buggy could be placed? It can be known.

The automobile manufacturers, and their agent in each county, know it and work every prospect.

How many buggy dealers are there that are seeking customers to the extent that they are willing to take their automobile, go and get a prospective buyer, and bring him to their repositories, sell him a buggy, hitch in on behind his machine, and take his customer with his new buggy home? There are some.

The chairman of this committee knows of one that has sold

four carloads of buggies this summer, and he is delighted with his business.

How can you sell, if you say you can't?

If you have "Has Beens" in your sales department, who say they can't, get "Izzers," who say they will.

There were 35 manufacturers, who have heretofore been classed as wholesale manufacturers, and who are known to still be in the business, who failed to reply to the third request of the committee. The chairman estimates that their product would be between 40,000 and 50,000.

Eighty-two smaller manufacturers, known to be making some new work, also failed to respond, and the chairman estimates that their product would be 10,000. These estimates are not included in the statistical statement.

If these estimates are correct, it would bring the total number of buggies, carriages, spring wagons (spring work), up to 457,023.

It is fair to assume that the wheels, shafts and poles, and axles sold in excess of the number of buggies reported as being made were used in repair work.

The Hickory Products Association, of Chicago, and to whom the committee is indebted for the data with reference to the number of sets of wheels produced, gave the committee the following information:

"The number reported was 59.8 per cent. of the normal product of the factories reporting.

"Of 43 wheel manufacturers, who were asked for information, 29 furnished the data requested. Six reported they manufactured automobile wheels only. Three reported that they had gone out of business, or had consolidated with other concerns, and five did not respond. Of this five, two are known to be in receivers' hands, and none of the five is a large concern.

"The shrinkage in product is attributed to the following causes:

(By 10) To the automobile trade and the general business depression.

(By 6) To the low price of cotton in the south.

(By 5) To automobile competition only.

(By 4) To the European war.

(By 3) To generally poor business conditions.

To the Democratic tariff; to lack of confidence in the government, etc.

"The general tone of the comment regarding the future of the wheel business was discouraging, though some correspondents took a hopeful view. Some of the comments were:

(By 8) The wheel business is a diminishing industry.

(By 4) We are pessimistic regarding the immediate future.

(By 2) We are, frankly, doubtful about the future.

"Favorable comments were as follows:

(By 3) We think the future is bright and look for an immediate change for the better.

We think the prospects are fair to moderate.

The business can be greatly improved by persistent effort.

It may continue to decline, but we think the low water mark has just about been reached.

The business will come back slowly, mostly in the cheaper grades, because the automobile is taking the place of the better grades of buggies.

If the war were ended and a Republican administration put in Washington, we would all be working full time."

Respectfully submitted.

O. B. BANNISTER, Chairman.

The report of Trustees of the Technical School was next submitted. [This was published in the September issue of The Hub].

The report of the Committee on Freight and Classification, Mr. Luth, chairman, was read by Secretary McLear:

REPORT OF FREIGHT AND CLASSIFICATION COMMITTEE

Probably at no time in their history have the railroads been so active in raising rates and altering classifications, rules and regulations which in themselves also constitute advances in transportation costs.

Wide publicity has been given the attempt at general and sweeping advances, but many advances in changed classifications, rules and single rate items never reach the public prints.

Your freight and classification committee has had to be keenly on the alert to ascertain and guard against changes that would be unfair to the industry or discriminative in any way. We believe we have been fairly successful, and embody in this report the most important matters handled during the preceding year.

In November, 1914, protests was made to the Southwestern

Lines operating in Arkansas, Louisiana, Texas and Oklahoma, against a change in rules governing minimum weights to be applied where carriers, for their own convenience, furnished cars of greater capacity or dimensions than ordered.

The rule as amended, penalized the shipper of light and bulky freight in a very arbitrary manner, and in such a way as to deny him the opportunity of protecting himself. The railroads did not look with favor on our intentions, and it was only after a long and hard fought campaign that we succeeded in convincing a committee representing the larger Southwestern Lines, that we were right. This rule was therefore amended in April, 1915, in such a way as to remove the objectionable features.

The Southern Classification Committee has published, to become effective January 1, 1916, a rule somewhat similar to the one objected to in Southwestern territory. We have entered protest and hope to be equally as successful in this case as in the foregoing.

On March 1, 1915, minimum weights on vehicles to Colorado common and arbitrary points was made subject to Rule 6-B of the Western Classification. Under this rule the minimum weight on a 36 ft. car would be 20,000 lbs. grading to 28,400 lbs. on a 50 ft. car.

We asked the Interstate Commerce Commission to postpone effective date of this amendment until we could prove its injustice but they declined. The railroads answered our requests for restoration of former minimum with statement that advances were justified and fully explained to the I. C. C.

It was our understanding that all commodity minimum weights, 20,000 lbs. and under, in the Western Classification territory were to be made subject to Rule 6-B. Our vigorous protest and able argument therefore not only corrected this condition to Colorado common and arbitrary points, but no doubt prevented its spread to other territory.

At the same time that the question of Colorado minimum weights was being discussed, we also protested against cancellation of the rule governing use of two cars, where one car could not be furnished, to accommodate the minimum weight.

Rule 375-A of Trans-Missouri Tariff 11-J was finally amended as agreed at conference of representatives of railroad and vehicle interests at St. Louis. This rule, however, requires further amendment before properly serving the purpose for which it is intended.

In I. & S. Docket 545, known as "Trap or Ferry Car Case" and I. & S. 435, known as "Car Spotting Case," we added our testimony to the mass of other testimony gathered at the several hearings. The favorable decision of the I. C. C. in these two cases has been given general publicity.

In I. & S. 549 covering stopping of cars in transit, to complete loading or partly unload we prepared considerable statistics and exhibits, and members of the committee testified in person at the hearing held in Chicago. This case was also decided by the I. C. C. in favor of the shippers.

We believe it appropriate to here mention the activities of a committee representing 22 carriage manufacturers in an attempt to adjust the general minimum weight conditions west of the Mississippi River. This committee was acting in conjunction with the freight advisory committee of the C. B. N. A., and its object was a betterment of transportation conditions for the carriage industry, and well deserved the support of this association. If successful many would have been benefited and none injured.

An entirely erroneous idea of the purpose of this committee gained wide publicity and the matter was dropped regardless of its undoubted value to the carriage industry.

In conclusion, therefore, this committee desires to state that a great and beneficial task lies before your future committee in harmonizing transportation costs, rules and conditions to the needs of the carriage industry of today.

Respectfully submitted,

THEO. LUTH, Chairman.

The report of Committee on Abuses in the Carriage Trades, Mr. Perrin P. Hunter, was submitted as follows:

REPORT OF THE COMMITTEE ON ABUSES IN THE CARRIAGE AND ACCESSORY TRADES

Your committee on abuses bow to the accessory trades, as they have no abuses. They manufacture, sell, and profit automatically. Therefore they are to be congratulated.

Manufacturers of horse-drawn vehicles in the past have "drawn rain from the clouds" in the shape of inviting abuses and yielding to unfair allowances, rather than lose certain customers.

Co-operation and exchange of ideas have largely eliminated many abuses in the last two or three years.

Agitation by this committee finally brought about a very satisfactory warrant or guarantee.

Future selling contracts will most likely have a clause covering breakage and repair items to the satisfaction of both sides.

Careful deliberation by the various dealers' associations have done much to lessen the unfair deductions that formerly took place at the close of each season.

Greater strength, better finish and more uniformity have been added each year by our craft, and standardization confronts our industry—all of which will largely lessen the chance of abuses.

We bespeak an advancement in our industry, and a closer fellowship with those who sell our product—with a fair understanding at the outset, and a warmer feeling at the closing of each season with reference to allowances or abuses.

Respectfully submitted,

PERRIN P. HUNTER, Chairman.

A vote of thanks was extended to the various committees for the able and painstaking work done in preparing these reports.

Secretary-Treasurer McLearn submitted his report as follows:

SECRETARY-TREASURER'S REPORT FOR 1914

(H. C. McLearn, Mount Vernon, N. Y.)

The treasurer of the Carriage Builders' National Association submits his annual report for 1914, January 1 to December 31: Cash in bank, January 1, 1914..... \$3,157.22

Receipts during the year:

From dues, interest, exhibition and dinner tickets, etc.....	\$7,759.74	
Contributions to the Technical School..	2,074.45	
Associate members association.....	1,349.00	\$11,183.19
		<hr/>
		\$14,340.41

Expenses during the same period:

General and regular.....	\$8,602.20
Paid trustees of the school.....	2,367.82
Deposits in bank, January 1, 1915.....	3,370.39
	<hr/>
	\$14,340.41

Contributions toward the support of the Technical School during 1914:

Automobile Chamber of Commerce.....	\$2,000.00
Interest on bond held for the school.....	45.00
From the school correspondence class....	29.45
	<hr/>
	\$2,074.45

In accordance with Section 2 of Article 2 of the By-Laws we report new members in 1914, as follows:

Active

E. L. Roninger, The Banner Buggy Co., St. Louis, Mo.
L. L. Woodward, Fitz Gibbon & Crisp, Trenton, N. J.
F. R. Wilson, The Hercules Buggy Co., Evansville, Ind.

Associate

M. S. Bottume, C. Cowles & Co., New Haven, Conn.
Parker R. Browne, Boston Shoe Co., Boston, Mass.
H. G. Brown, The D. Wilcox Mfg. Co., Mechanicsburg, Pa.
J. Sibley Felton, Felton-Sibley & Co., Philadelphia, Pa.
W. J. Greening, The Greening Axle Co., Middletown, N. Y.
Charles W. Hotchkiss, The National Malleable Castings Co., Cleveland, O.
Phillip A. Hunt, International Rubber Co., New York.
E. P. Heckman, E. J. Gardner Axle & Machine Co., Carlisle, Pa.
Rudolph Krobitzsch, Peter Woll & Sons Mfg. Co., Philadelphia.
T. L. Kauffman, The Pantasote Co., New York.
A. Kretzschmar, Thos. P. Skelly Bolt Co., Philadelphia, Pa.
Geo. A. Lambert, The Simplex Short Turn Gear Co., Anderson, Ind.
John A. Moroney, Goodyear Tire & Rubber Co., Akron, O.
Harry R. McMahon, Standard Steel Spring Co., Coraopolis, Pa.
W. H. Oliver, The Republic Iron & Steel Co., Philadelphia, Pa.
H. T. Piper, The Zanesville Gearwood Co., Zanesville, O.
Louis H. Rogge, The Zwick & Greenwald Wheel Co., Dayton, O.
N. W. Spear, Price Leather Co., Boston, Mass.
E. E. Sanford, The Standard Oil Cloth Co., New York.
A. T. Wishart, National Lock Co., High Point, N. C.
Joseph Wallenstein, The D. Wilcox Mfg. Co., Mechanicsburg, Pa.

Mr. Perrin P. Hunter: Regardless of some of the remarks that were made on this floor yesterday as to the depression that is sweeping over our carriage industry at this time, I feel that the inauguration of the regional bank caused a cloud to

come over the dealer and carriage builder more than anything else in this country. This European war has had its effect in a way, but the crops in this country are the best we have ever had, and there is no reason why the farmer's paper is not good. I know many places where the banks are not loaning to the dealer. They have loaned him before all the way from \$5,000 to \$10,000 and have taken the farmer's paper, and they have been glad to get that paper, but that is not so today. I have talked with some of them as to why they wouldn't take the dealer's paper, backed by the farmer's paper, and you say to them, "You are operating a national bank?" "Yes." "Well, have you made application to Cleveland; have you ever borrowed any money from them?" No, sir; not going to borrow any money from the reserve bank." "Well, that is rather a strange thing. They are willing to loan it to you." "Well, there is too much red tape attached to it." I was in a bank not long ago in southern Ohio in a small town, and the cashier answered the telephone while I was there, and the talk was about that subject. After the cashier had finished, I said, "You can't blame me for listening; you were talking out loud. You told that man you didn't have any money. Now," I said, "that is not a fact hardly, is it?" "Oh," he said, "no, but we are taking care of the mills here mostly. Our president is interested in two of those iron mills here, and we don't care to take that paper. They are inclined to be slow pay." "Well, have you made application to the Cleveland reserve bank for any money?" "No, sir, and we are not going to. The kind of paper we get as a rule we couldn't present there; it isn't always paid on maturity, and there is a little embarrassment." And he said the greatest thing of all was the fact that every note or piece of commercial paper nearly that they presented would have to have a certificate attached to it that it was for actual commercial transactions, so that there was no chance of that paper being kited. I do happen to know that that particular national bank does have paper there that is for accommodation; it is deposited for speculative purposes. And you find that same thing all through the south. They are not applying to Atlanta for money. They don't understand what there is in the regional bank. It came on the same time as the war did. They have all let it alone.

The time will come, I suppose, when the regional bank will reach out and educate the smaller bankers, so that they will get funds if they haven't got them, so that they will help the dealer out; but that has been the greatest backset in this business this year in every part of the United States. I hope that we have members in this association among the accessory and carriage manufacturers who will know a process or plan whereby those country bankers can be brought to a state of mind so that they will loan their funds.

The farmer's paper is the best security there is. I realize that perhaps in many cases it is not paid on maturity, but a little later it is paid. He grumbles a little about the interest, perhaps, but he pays it in the end.

The general depression as carried over the country is really not so bad. There have really been 20 years of prosperity in this vehicle industry when nearly every one of us have made a very good clean profit. Most of them have laid something away, and if you have one or two or three bad years out of 20 or 25, you have no reason to feel hurt. Indiana is mentioned in Mr. Bannister's list as having had 66 per cent. normal business. Well now, that is not so bad, gentlemen. Some states have gone to 20 or 25, but it is only for a year or two. We will outlive it.

The statistics issued by the government show that we had last January 24,000,000 horses in this country. They have to attach something to them. There is the tractor and all those things coming, and if you want to get scared, of course you can do so. It was much the same with the bicycle. When it first came out, the big concerns like the Standard Wagon Co., were lying awake nights. They actually thought the horse-drawn vehicle business was gone, on account of the bicycle. But it is still here. As to the automobile, it has no bearing against our industry, except that it is speed and luxury. The dealers scattered around over this country, on the advent of the automobile, I will admit, with the flurry and stink of gasoline along the streets, they thought it would put them out of business, and they just went back in the office and sat down. When it comes to the advertisement of the automobile, that is a flash. The only thing we really can do is to standardize our buggies and have a little more heart to heart talks with the dealers and urge the hardware stores and the dealers to take up the buggy again and put it before the people of their community. If a dealer buys one car of cheap or medium priced automobiles, he goes down to the bank and puts up about \$2,400; he gets six small automobiles, and pays cash in advance. About \$400 is all the profit that he can expect from them. They fix his price, and they fix his profit. This same amount expended in buggies of the \$50 value would get him 48 top buggies upon which he can earn \$850 to \$1,000. Those

that sell for cash will take a smaller profit. Those that take \$15 or \$20 down and the balance at \$10 or \$20 a month, the profit is larger. In the south there are hundreds and thousands of buggies put out on a note, in February, March, April or May. That note is due November 1. It doesn't bear any interest in the meantime, but the selling price returns them a wonderful profit, equal to 40 or 50 per cent. on the investment. So that for \$2,400 worth of buggies sold in the south, your return should mean possibly \$1,200. There are many reasons why they should turn back to the buggies. It takes less capital, and in a way I may say it takes less push, and it does yield a larger profit, and it is up to our members in the various associations we have to see if we cannot enlighten the buggy dealer, or those who have been handling automobiles, so that they may see that there is a greater profit in handling buggies.

President Wrenn: Our executive committee wishes to announce the election of Mr. E. D. Clapp, of Auburn, N. Y., as a member of the executive committee.

Secretary McLear then read the names of officers as reported by the committee, and on motion the secretary was instructed to cast the ballot for the persons named as officers of the association for the ensuing year, which was accordingly done.

The report of the Committee on Resolutions was read and is as follows:

Resolved, That the hearty thanks of this association are due and are hereby tendered to the local committee which has so lavishly provided for our entertainment in the "Forest City."

Our thanks and appreciation are also extended to Manager Thompson of the Hollenden Hotel—"our headquarters"—for courtesies not only as host, but also, for his generosity in defraying the entire expense of the Central Armory for our meetings and exhibition.

Our thanks are also extended to the press of the city for the publicity given to our proceedings.

We also thank the publishers of our trade papers, which so largely and gratuitously contribute to promoting the interests of the C. B. N. A.

Resolved, That we, The Carriage Builders' National Association, in annual session, hereby respectfully recommend the enactment of state laws in the several states requiring all vehicles to display lights at night which shall be visible from both front and rear.

We urge the adoption of this resolution purely as a "safety first" measure, the object of which is to safeguard the life and limb of all persons using our public streets and highways. Adopted.

The report of the Obituary Committee was read by Mr. Hutcheson, as follows:

REPORT OF THE OBITUARY COMMITTEE

Death of members of an association is always a solemn event because of the ties of friendship and love then severed. The record of the past year is especially so because of the prominence and the age of those who have passed into the silent land since our last meeting.

Honorary

A. Delancey Kane, New York, April 4, 1915, aged 71 years. A lover of horses and carriages, and international whip.
Geo. N. Hooper, Emleigh, Beckenham, Kent, England, January 12, 1915, aged 89 years. An honorary member of international fame as a builder of fine vehicles and an author of books on vehicles.

Active

Carl P. Schlamp, Henderson, Ky., April 17, 1915, aged 43 years. A member of our executive committee.
David M. Parry, Indianapolis, Ind., May 12, 1915, aged 63 years. A former president of our association.

Associates

Charles J. Forbes, Cleveland, O., November 20, 1914, aged 61 years.
Alfred Hess, Carthage, O., December 19, 1914, aged 79 years. A long time member.

T. D. Ayres, Reading, Pa., December 26, 1915, aged 61 years. Therefore, be it resolved, that we join with the friends and relations in the sorrow of their bereavement, and that we extend to them our most earnest sympathy; and

Resolved, That as a token of our high regard and esteem, that this report be entered on our association record, testifying to our respect for each of them.

A. M. WARE, Chairman.

The report was adopted by a rising vote.

Mr. Luth offered the following resolution:

Be It Resolved, That the Carriage Builders' National Association recommend that while the widespread improvement and building of new roads is being carried on throughout the country, special provision be made to build all roads of sufficient width and character to give proper accommodation and protection to horse-drawn pleasure vehicles.

The resolution was unanimously adopted.

Cincinnati was selected as the next meeting place. The Chamber of Commerce of that city guarantees, entirely free to the association, the use of all or any part of an exhibit hall with 100,000 square feet of floor space, with adequate meeting facilities above the exhibit hall. This hall is lighted and heated and electric power can be had if desired.

MEETING OF THE ASSOCIATE MEMBERS OF THE C. B. N. A.

The annual meeting was held in Convention Hall, Cleveland, O., Wednesday afternoon, September 22.

The minutes of the previous meeting were read and approved.

The nominating committee reported in nomination the following named members, who were unanimously elected:

President—Elmer J. Hess, Western Spring & Axle Co.

Vice-president—W. A. Notman, McKinnon Dash Co.

Secretary—Homer McDaniel, Cleveland Tanning Co.

Treasurer—John McGrath, Eberhard Mfg. Co.

Executive Committee—Elmer J. Hess, W. F. Gibbons, John McGrath.

Upon motion, it was resolved that Mr. D. E. Clapp, of The E. D. Clapp Mfg. Co., of Auburn, N. Y., be recommended to be the representative of this association on the executive committee of the C. B. N. A.

The secretary announced that the treasurer's report will be mailed to members of the association shortly after the close of the meeting.

C. B. N. A. CONVENTION ENTERTAINMENT

Tuesday evening, September 23, was given over to the annual reception which took place at the Hollenden Hotel. The following were in the receiving line: President C. O. Wrenn and Mrs. Wrenn, Mr. and Mrs. P. E. Ebrenz, and Mr. and Mrs. W. H. Roninger. After the reception, dancing was indulged in till a late hour.

The banquet at the Hollenden on Thursday evening was of the speechless order and no liquors were served for the first time in many years. Following the dinner the local entertainment committee furnished a musical entertainment of the highest order interspersed with dancing by professionals. The balance of the evening was given over to dancing. The committee responsible for this evening's entertainment fully merited the many compliments heard on every hand.

MEETING LEATHER MANUFACTURERS' ASSN.

The Patent and Enameled Leather Manufacturers' Association held their annual meeting at the Hollenden, Cleveland, O., Wednesday afternoon, September 22, at 2:30 o'clock.

The meeting was called to order promptly by James F. Taylor, president.

The following committee was appointed to devise a uniform cost system: Jas. B. Reilly, secretary; Chas. L. Whitney, Conneaut Leather Co.; Harry N. Hill, Cleveland Tanning Co.

The following new members were unanimously elected: Ryan Leather Co., Newark, N. J.; Bryon Leather Co., Williamsport, Md.; E. H. McCormick, Newark, N. J.

The election of officers for the ensuing year resulted as follows:

President—James F. Taylor.

Secretary and Treasurer—James B. Reilly.

New directors chosen were: A. Rothschild, of Stengel & Rothschild, Newark, N. J.; Herbert Gay, of Blanchard Bros. & Lane, Newark, N. J.

The firms represented at the meeting were:

American Oak Leather Co.—J. F. Taylor.

Cleveland Tanning Co.—H. N. Hill.

George Stengel Co.—Harry Stengel.

Max Hertz—Max Hertz.

Stengel & Rothschild—A. Rothschild.

Conneaut Leather Co.—Chas. L. Whitney.

Hugh Smith Co.—Jas. T. Smith.

Blanchard Bros. & Lane—Herbert Gay.

CARRIAGE WORKS MANAGED BY A WOMAN

One of the oldest and most successful factories in Wichita, Kas., is managed by a woman.

It is located at 157-159 Water street and is known as the M. A. McKenzie Carriage Works. Few glancing at the old weather-beaten sign imagine that the proprietor of the busy plant it advertises is a woman, but such is the case.

When Dan F. McKenzie, husband of M. A. McKenzie, died in 1890, which was long before the day of agitation for women's suffrage in Kansas, although many women were entering what before had been regarded as men's trades, Mrs. McKenzie took charge of the business and has managed it most successfully for the ensuing 25 years.

The sign above the shop reads: "M. A. McKenzie, Established 1884, Rubber Tires, Carriage Painting, Trimming, Repairing."

But now, although the factory still builds a few carriages, its main business is the building and repair of auto bodies, such great strides in locomotion have been made in recent years. And with Mrs. McKenzie now are associated her two sons, Leo L. McKenzie and Donald E. McKenzie, children when their father died. Living next door to the shop, they almost grew up in it, so to say, and now are taking the burden of detail management off the shoulders of their mother, although Mrs. McKenzie still actively supervises the business and is at the shop every day.

The factory is equipped to build any kind of tonneau or fine car or truck body made, either from original or copied designs or from designs to be originated. One of its most recent jobs is the body of the police patrol mounted on a Hudson chassis, a piece of work which authorities say rivals that produced in the finest wood-working centers of the country.

The McKenzie factory has done a number of city jobs. In 1886 is made two hose wagons that the city used 26 years, at the end of which time the original axles and bodies still were intact. The wagons were used at stations Nos. 1 and 2 and later at the Central fire station. It also has built several of the fire chief's buggies. It rebuilt the police patrol which was burned. The factory has repaired Wells-Fargo express trucks for 26 years. For a long while, such great confidence did express officials have in the honesty and ability of the factory's employees, they shipped it trucks to repair from Texas and other southwestern states.

The factory falls heir to the auto-body trade naturally, one might say, as most of the auto-body makers formerly were carriage makers.

The factory lately has secured the services of George Holtzman, formerly general foreman of the Laclede plant of the St. Louis Car Co., employing 300 men.

The McKenzie plant employs from eight to 32 men. It works usually about ten. The business of the factory is growing so, however, Mrs. McKenzie has an architect at work on plans for a new factory building with equipment to employ 50 workers.—Wichita Eagle.

Fire damaged the plant of the Twin City Carriage Works, St. Paul. Two auto trucks just completed and several carriages were destroyed. The damage to the building was slight.

Twenty-fifth Annual Meeting of C. H. A. T.

The twenty-fifth annual meeting of C. H. A. T. was held at the Hollenden Hotel, Cleveland, O., September 21, 1915. President G. A. Tanner called the meeting to order at 8 p. m. and welcomed the members in the following address:

ADDRESS OF PRESIDENT G. A. TANNER

Fellow members of the Carriage, Harness and Accessory Traveling Men's Association:

Again we meet after 25 years of earnest effort to be of service to one another.

As these events are computed we are enjoying our silver anniversary, and those who have borne the burden of the work to do good in all that time, may fairly claim that it is a celebration of the ideals and aims that have been justified in the light of the purposes of the founders of our association.

The association has never been as great in numbers as we have had a right to hope for and count upon, but it has never lacked a full majority of earnest and devoted men who counted their time as nothing in the balance when the objects of our organization were to be promoted.

The objects we strive to keep alive, as told in our constitution, are such as to arouse the better nature of a man, to make him love his fellowman, and to cause him to help with all his strength when a call for aid is heard; therefore, no organization is more worthy to live and grow.

Our organization has lived a long life, compared with many, even most business associations, so that now that the roots have struck deep, we are justified in looking for more bloom, more fruit. We, the men of today, this year, are the laborers in the vineyard, and to us falls the duty to cultivate, to encourage growth, and not to fall to sleep over our self-imposed labor.

If the germ of a good thought, a good word and a good deed was not at the base of our association, we would have had no meeting today. But we must work harder, we must not forget our obligations for a year at a time, and we must be more careful and prompter in discharging our cash obligations to the association especially.

Of course it is largely due to thoughtlessness that so many members permit themselves to fall into arrears of dues, but you can see that it is unfair to those who are not forgetful of obligation, and it is positively injurious to the vigorous pushing of our work.

To live and grow we must have new members, we must have many more new members than we acquire in a year's time, and very few indeed are the organizations so happily constituted in membership to make this effort simple and easy. We are business travelers, we meet, and are in touch almost daily with friends and acquaintances on the road to whom a well-timed word would create a new member, and at the same time secure his cash. To add 50 per cent. to our roll in a year ought not to be even a light task, it is so simple.

On this subject I have yet another suggestion to make that is in the line of what is called new business by some of us. It is this: We should all make a dead set for new membership among the royal good fellows who are in the automobile accessory line. We must move with the spirit of the times, we must consider the automobile accessory as an outgrowth that we could not take thought about at the time our association was born, but which has since grown into our sphere of usefulness and helpfulness. Many such travelers were formerly carriage trade missionaries, many are today pursuing both lines because the concerns they represent are catering to both branches of this all-inclusive vehicular trade.

These men are legitimately proper members for us to welcome to our ranks, and many of our present members know a lot of such men. Why not, then carry the good news to these men, and let them know about an association that is likely to be helpful to them in time of stress or ill-luck?

Our hard working secretary, who has done so much toward keeping the wheels turning over, will tell you in his report just our position. We cannot truthfully point with satisfaction to acquiring merely 16 new members during the current year. It is not more than enough to counterbalance those who have dropped out, or who have passed over the divide toward which we are all journeying. It is plain we can do better. If we have something of good to offer the 16, we have as much to make it worth while to 116. It is merely a matter of the right word

at the right time; and we must depend upon the spoken word. It is that alone that influences, that brings results. It is the tool of trade that we are using daily in our private business, so why grudge still another for the good of the C. H. A. T., when it is so easy for us to speak it? There is no effective way to gather in new members by means of the printed word, because those we seek are a shifting quantity. Here today, there tomorrow. No secretary can help us to do the work that is our individual work. I hope I have made this as strong as I personally feel on the subject, so that I may leave the matter in your hands with the highest hopes for the future.

We are a good, solvent business organization, as you will learn, and we have a small, very small, sum laid aside for a rainy day, or to do a good turn to a member in distress, when the proper authority can see its way clear to do so.

Our record of good done on proper occasions is one to make us feel not ashamed, and to clearly show that we mean what we say in our statement of the objects of the organization. Bear these points in mind when speaking to your fellow travelers.

I think it might be practicable in making up the committees for the new year to have one on new members so constituted that it would work in territorial groups, a few to a section. Perhaps in this way our secretary could keep in closer touch with the work of such a committee, and render much aid in the matter of documents to be handed out, follow-ups of names given in as possible members, etc. I see no good reason why we could not be nearly as efficient in such work as a business concern. Perhaps a trial would please us. I offer it as a suggestion to build upon.

Everything points to an interesting meeting this year. The annual reunion of old and tried friends is of itself a pleasure worth striving after. We go to our homes refreshed and encouraged, and for a time, at least, we have the interests of our association fresher in our minds and stronger in our hearts.

We have been favored, as usual, by the hearty and unselfish work of our friends in the trade press, and I believe they are willing to go to great lengths to help along the prosperity of our organization. Perhaps it would be well for our secretary to try them out. The successors of the present officers may find this a useful suggestion. Making a noise in the press attracts attention, and stimulates inquiry, so that the gathering of new material becomes still easier.

Our banquet, as usual, will be a notice to our employers, who sympathize with our aims whole-heartedly, that we are on earth very much alive, and a body of men whom it is an honor to call friends. May the year on which we are entering be the high-water mark of our prosperity as an association; may it be a fitting present from Father Time to us on our silver anniversary, and may we ever ring true in our aims, our endeavors, our hopes, like the pure silver that typifies our official twenty-fifth year; may we all here present meet a year hence to renew our pledge of friendship as earnest members of C. H. A. T.

The report of board of directors by Ex-president W. W. Wood, was then received, accepted and ordered placed on file. It is as follows:

REPORT OF THE BOARD OF DIRECTORS OF THE C. H. A. T., INC.

Your board of directors begs leave to submit the following report.

Once again the horologe of eternity strikes the hour of our annual gathering. For the second time we are assembled in Cleveland and are enjoying its lavish hospitality.

Twenty years with their hopes and fears, their struggles and triumphs, their joys and sorrows have sped on Time's rapid wing since we convened in the "Forest City" in the then youthful days of the C. H. A. T.

The gong of time has rung great changes since our first gathering in Springfield, Mass., in 1891—yea, great changes even in the two decades since our former meeting here in 1895; changes in scenes, in times and conditions, and in the personnel of our association.

Many of the old faces have gone where the rush of the years never more will trouble them; others have been affected by the evolution of time and conditions. While the automobile has

retarded and greatly affected the horse-drawn vehicle industry, it has not halted it and will not halt it.

The statisticians of the trade report that a million horse-drawn vehicles were made last year.

This committee of the Carriage Builders' National Association has compiled a list of all the manufacturers of vehicles in the United States showing an investment in their business of \$5,000 or more. This list shows a total minimum investment in the manufacture of buggies and light spring wagons of over \$35,000,000. The investment in manufacturing establishments making accessories exclusively is probably as much more. An industry in which there is invested \$50,000,000 producing more than \$60,000,000 yearly is certainly worthy of the most enthusiastic and exclusive attention of the men engaged in it, and calculated not only to interest, but inspire to greater confidence all those whose thought and work are bound up in the present and future of the buggy business.

The horse still lives notwithstanding the extravagant assertions of the automobile industry. It will take more "gas" than all the combined automobiles so far have consumed to asphyxiate "man's best friends."

Looking backward over the year that is past; a year fraught with doubt and uncertainty in the commercial field, we find abundant cause for congratulation, small cause for discouragement.

We are pleased to think there has been a gradual improvement in confidence and business, and notwithstanding the dark war clouds of Europe, whose sombre shadows have spread to our shores, there is a hopeful feeling that the storm-tossed waves of doubt and distress may soon subside, and the old bark of commerce once more sail on the seas of restored confidence and prosperity. Let each hasten this end by ceasing to "croak" and strive to encourage prosperity. Our country is too large and strong and intelligent to allow commerce a long halt, and all are waiting the command, "Forward, March!"

The commercial traveler is the architect of his own fortunes. With his irrepressible hustle and energy and his ever ready joke he is constantly working for his employer's interest, and he should have the "glad hand" wherever he goes, and if he is met half way he is sure to benefit all with whom he comes in touch.

We have a splendid organization and we must maintain it. Let each one do his part and work for its best interests, so that we will be stronger at each annual meeting. At these annual gatherings we get new impressions that make us better and more proficient in business. By imbibing the ideas of those who have been successful, we can apply them to our needs and profit by their knowledge.

The secretary has done splendid work during the year. He is the wheel horse of the association. In fact he largely pulls the whole load, and is the hub of the whole thing, and everything is accounted for right to a penny.

His report shows a balance on the right side of the ledger, and a slight gain in membership.

The "Grim Reaper" has gathered his annual toll; four have dropped to eternal sleep, and the obituary committee will pay tribute to their memory.

We recommend action be taken on delinquent members, as will be reported by the secretary.

Our annual dinners of the past three or four years have been very successful, not only in interesting our membership, but also men prominent in the C. B. N. A. A good dinner is a good advertisement, and that arranged for this year will be one of the pleasant events of this week's dual gathering.

The whole thought and purpose of our association is to improve and raise the standard of the membership. Two of the things necessary to do this is to work hard and to be faithful in attendance.

We reiterate our belief that the association could be made of more practical benefit to both employer and employee if more attention were devoted to the employment information bureau by advising the secretary of salesmen desiring positions and firms desirous of employing salesmen.

We would also recommend that a committee be appointed to arrange a program for the conduct of the convention a year hence, to create a more business-like atmosphere in our meetings, by securing members or guests in advance to make short addresses and prepare brief articles on germane subjects of interest.

By all putting a little effort forward we certainly can accomplish some wonderful things for the betterment of the C. H. A. T. Above all things traveling men should attend the meetings. Those who have never attended don't half know of the good things they are missing.

The good, experienced salesman of irrepressible energy is never a failure. To fully succeed he must thoroughly know his business. Before a man is allowed to go into any business that brings him before the public, from a ham sandwich lunch wagon on the street corner to the largest wholesale department

store, he has to pass an examination to see if he knows enough about the business he proposes to conduct, to run it without injury to his competitor or himself, and every man who has been a success in all lines of business will tell you that the good business man never causes any trouble.

If we had a law that demanded of a man the same knowledge of buying and selling that the law demands of the druggist we would have very few failures in business, which lead to the natural result of cutting down the high cost of living, for every business failure costs money and has to be made up in some way, and the ultimate result is the consumer pays the freight.

Your committee wishes to congratulate the "old guard" on the happy thought that suggested the organization of this association where salesmen can get together and legitimately compare notes, aid each other with timely suggestions which help to make better salesmen and more successful business men. There is also the social feature of a gathering of this kind which should not be overlooked, where the personal contact, the personal acquaintance with each other can do much toward eradicating that feeling of jealousy and selfishness which too often hangs like a millstone around the neck of business rivals.

The lesson that this gathering can teach is that there is room enough in the world for all and that it is every man's duty instead of trying to down some one else, to better his own condition and provide a moderate competence for himself and those dependent on him.

Every one will admit that the salesman deserves a fair return for his labors. Every one will admit that the thorns in the road grow thicker and the stones sharper with increasing years and competition. Every one knows how costs have advanced and margins of profit shrunken, and living necessities have steadily advanced.

The fact that a man has repeatedly said "no" on your first or second call is no sign that he won't say "yes" if you go back to him the third time with a little better aim and ammunition.

After a string of failures, it is ceaseless pounding that puts things through; it is the last blow of the hammer that breaks the rock; it is the tired runner that forces himself to sprint at the finish who wins the race, and to make a success of this organization each and every member must do his part, be it ever so little. It is as hard to keep a good man down as it is to help a poor one up.

Your thoughts are servants of your will. You are master of your own house and you can entertain whatever guest you please. Keep your plate constantly set for happiness, and she will be your guest at every meal.

In order to make this association more successful we must all do something. Most misguided people think they are down on their luck when things don't go their way. As a matter of fact, what they are down is not luck but pluck. The more pluck—the more success.

Let us remember that if there ever was a royal road to success and achievement it lies before the man who is constantly on the lookout for ideas, takes his own ideas and those of his fellows and weaves them into his daily life and his business. Don't be ashamed to look for ideas; glory in it; improve it by constant progress; get all you can out of it and pass all you can along to others. Success often comes from knowing what to expect and when to expect it. The average man would find it easy sailing if he could make money as easily as he could love.

In the development of this country it is organizations and not individuals that are accomplishing the larger gains. Join with others and help to educate men to success.

The sky should be filled with the smoke of American industry, which will rest forever on the brow of perpetual promise. The man who goes through his allotted time in this old world without trying to make it better amounts to little.

Judging from his experience, we do not see why every salesman who is entitled to be present at this convention does not make every effort to attend. If he neglects it it is probably because he does not realize what he will miss. This organization is like many others, in that the men who receive the greater benefit are the ones who put the most effort into the work, on committees, in their local association, etc. Each man should do something however small to raise the standards of the work that both he and his brother craftsmen are doing. One of you acting individually can make some progress, two in company can do more, and ten acting together can accomplish much more than ten times the results of one person.

Yes, the drummer is a hummer; he takes his grip, he gives his tip, then takes a skip, to sell his goods in towns, or woods. He eats his grub at inn or club; and oft looks glad when he is mad; goes without sleep; yet has to keep a smiling face in every place; he comes, he goes, with joy, or woes, but shows his joys to all the boys and hides his woes where'er he goes. He's full of grit, he shoots to hit, and does not quit until he strikes, and then he pikes. A good seller, good yarn teller.

royal fellow. Welcome this knight and treat him right—for the drummer is a hummer!

In the name of the C. H. A. T. whose motto is "All for one and one for all," your board of directors extends to you one and all a hearty welcome to the "Forest City" and a happy and prosperous time, and while our memories thrill with the yesterdays of our association, let us be vigilant and valiant for its tomorrows.

Respectfully submitted,

W. W. WOOD, Chairman Board of Directors.

The report of Secretary-Treasurer Nelson showed the association to be in a healthy and prosperous condition, and was accepted as read.

The report of the Obituary Committee by Ex-president Huston was accepted and the secretary instructed to send suitable expression of condolence to families of departed members. The report follows:

REPORT OF THE OBITUARY COMMITTEE

The Dark Messenger again has invaded our ranks and summoned home six of our brethren: N. D. Allen, George Balentine, Frank A. Brown, Charles J. Forbes, Walter L. Crossman, Max Robinson, have gone where the rush of the years never more will trouble them.

We cherish their memory in our hearts and tender our deep sympathy to their sorrowing relatives.

Resolved, That this memorial be spread on our minutes and a copy transmitted to their respective families with the consoling assurance that "He who doeth all things well" will tenderly heal their sorrow.

"We hear them not as they leave us,
And seek them in vain as they go.
We long for a touch of the vanished hand,
And the voices of long ago."

G. W. HUSTON, Chairman.

The election of officers for ensuing year now being in order, Ex-president Huston presented the name of C. J. Rennekamp, of Cincinnati, for president; nomination seconded by Ex-president Randall. Moved that nominations be closed and Mr. Rennekamp was declared elected.

On motion of Ex-president Wood, J. L. Nelson was re-elected as secretary-treasurer.

The report of the nominating committee on vice-presidents and directors was accepted and the nominees declared elected.

No other business coming before the meeting, same was adjourned.

JESSE L. NELSON, Secretary-Treasurer.

C. H. A. T. BANQUET.

The annual banquet was held at the Hollenden, Wednesday evening, September 22. There were over 100 in attendance, including a good representation of ladies. Music was rendered by the hotel orchestra. President Tanner acted as toastmaster and the following gentlemen made up the list of speakers: Phil E. Ebrenz, the new president of the C. B. N. A.; C. J. Rennekamp, new president of C. H. A. T.; W. W. Wood, T. M. Sechler, O. B. Bannister, Theo. Luth, W. H. Roninger, Homer McDaniel and George Taylor.

"PALANQUIN" IS NEWEST ADDITION TO VOCABULARY OF MOTOR INDUSTRY

The latest addition to the dictionary of motoring is the word Palanquin, recently adopted as a designating term for a seven passenger touring car, which can be converted into a luxurious closed car by the addition of a detachable limousine top. Romances of an early date invariably brought the heroine into view, either mounted on a white palfrey or reclining at ease in her gorgeous palanquin. Somewhere in the Scriptures note is made of the fact that "King Solomon made himself a palanquin of the wood of Lebanon," but history records that this type of conveyance was in use many years before Solomon's time.

The original palanquin as used in China for hundreds of years and in India, before the white man built good roads, was a wooden structure about eight feet long, four feet high, and four feet wide, with room for one person in a reclining position.

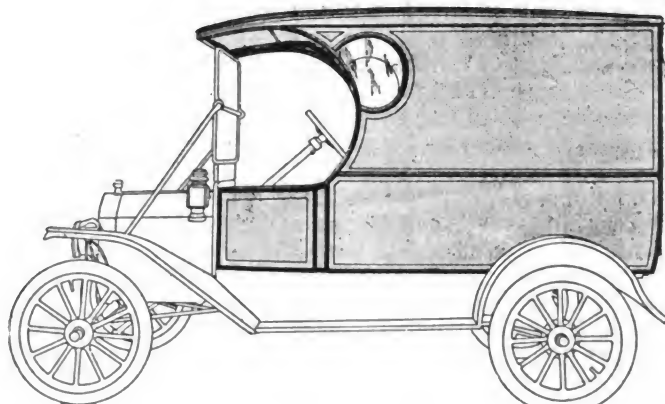
Four poles projecting from either end were used as handles by either two or four servants, who carried the outfit on their shoulders. Many of the royal palanquins were things of beauty and luxury, and hence the selection of the word by the ever avid publicity experts.

The automobile maker that has just announced its palanquin model, assures us that the word is of Japanese extraction and is pronounced "palan-keen," which would seem to render its common use an easy matter. We have had "sedan" bodies, first from one maker, and now from many, and the public has quickly assimilated the word sedan as typical of a certain body style. The more exclusive "Palanquin" will undoubtedly receive an equally hospitable reception from the motor elect of America.

PUTTING OUT COMPLETE LINE OF DELIVERY BODIES

The Commercial Auto Body Co., St. Louis, Mo., is putting out a complete line of bodies for delivery service and kindred commercial purposes which can be fitted to any chassis. These bodies are built with seasoned ash sills, ash frames with floors running lengthwise, reinforced hardwood floors with strips of steel, and durable trimming material. Leatherette is used in the cushions instead of cheap enameled drill, the cushions being one piece, open bottom spring design, locked in position so as to prevent them from springing forward and backward. All the roofs are full slatted, covered with heavy oil duck and on express bodies the curtains are of the same material.

Among the bodies which are made by this concern to fit any chassis, are the open express full panel delivery, light-



Panel delivery, one of the Commercial Auto Body Co.'s styles

weight express top with screen sides, light-weight canopy style top with flareboards, suburban canopy style for station work, flareboard delivery, demountable flareboard box and general utility box inclosed with double doors.

These bodies sell complete for \$100 with the exception of the light-weight canopy design with flareboards which is \$90 and the flareboard delivery which is \$60. The demountable flareboard box which fits on the back platform of a Ford roadster, or other type of roadster, is \$14.50 for the Ford, and \$19.75 for others. The general utility box is \$25 complete, and can be made to fit snugly on the platform of a Ford roadster.

A special line of delivery bodies for Ford cars made to be placed either on the Model T roadster or touring chassis, is of special interest. This includes the following types: A panel side delivery body, 56 in. long and 53 in. wide with double doors, for \$110; a panel delivery body of the same dimensions, with double doors having oval glass in the upper panels and drop sash windows at the side of the seats for \$115, an all steel panel body for \$120, an all steel delivery for \$100, duck curtain delivery for \$75, light panel side delivery for \$82.50, and demountable slip on body for \$95. In addition to these there are other bodies at corresponding prices.

HOLDING POWER OF NAILS

A nail holds itself in place in two ways: by friction of its sides against the wood and, when clinched, by the resistance of the clinch which resembles a second but smaller head. The combined resistance of sides and clinch represent the total holding power of the nail. Square nails are usually tapered on two sides and parallel on the other two; the tapered sides should bear against the end grain of the wood, crushing it gradually as the nail enters; and when it is fully driven it bears uniformly against this end grain crushing it without splitting. All woods when soaked in water or when green may be nailed with less risk of splitting than when they are dry, but there are limits to the depth that a long nail may be driven into any wood before it begins to bend, that is to say, when the friction of the wood overcomes the driving power of the hammer. When a nail begins to bend it shows that a hole must be made beforehand; and the size of the hole is a matter of some importance. Its object is to reduce the friction so as to allow the nail to be driven without bending, but if made too large, the holding power of the nail will be reduced and clinching will be a very imperfect remedy. If many nails of one size have to be driven as in boat building, it is advisable to experiment on a piece of wood of the necessary thickness in order to find out the right size of hole that will avoid splitting the wood, or bending the nail. When wire nails of a large size are used in drilled holes, the size of the hole should be such as will ensure a good fit; and if the nail is to be clinched it should be softened at the point by heating to redness. The wire nail is hard drawn to enable it to be driven without bending in soft woods, but it does not clinch well for this reason, and therefore needs softening.

The holding power of nails and screws may be ascertained by a simple experiment. The nail may be driven into an upright post leaving the head projecting just enough to be seized by a nail puller. This instrument is then attached and weights added to the outer end until the nail begins to move. A bag loaded with stones will serve the purpose. The nail puller consists of two levers formed by the extended handle and the projecting foot, and if the weight in the bag is multiplied into the length of the handle in inches and divided by the exact length of the foot measures from the nail to the point of contact of the foot with the post, the result will be the holding power in pounds of the nail.

Nails that have rusted after driving have an increased holding power, but if rusted before use they tend to make a slightly larger hole than a smooth nail, because of their rougher surface. In cases where clinching would be liable to split the wood, nails may be cut and riveted over a small washer. This makes a strong and durable joint. There is also a way of clinching a nail within the wood that is at times useful. The point is filed away on one side to a wedge shape and then bent over the filed part until the point is level with the side of the nail. A hole is drilled to the size of the nail which is inserted with the filed surface parallel with the grain of the wood. When driven, the point takes the form of a hook and has a strong hold upon the wood. The point of this nail should be heated and softened so as to facilitate the turning of the point.

Nails driven in wood that is exposed to alternate wetting and drying are liable in time to work loose. The wetting swells the wood and increases its dimensions across the grain, and as the nail is inelastic it is moved, a space forming at the point equal to the amount of swelling of the wood. When the timber dries the nail does not return to its original place, and if tapered it tends to move outward each time that the wood is wet and dried. It is for this reason that wooden structures bolted together and exposed to the weather require screwing up at intervals.

Screws offer an even more interesting subject for experiment, for it will be often found that if the hole for a screw is carelessly drilled it has less holding power than a nail. The holes for screws in hard wood should be very carefully made in two sizes: for the neck and the screw, respectively; and the point

of the screw-driver should be of the shape of the notch in the screw and not a chisel point as is usually seen. The chisel point reduces the hold upon the screw and spoils the notch so that the screw can rarely be used twice. The point of an Indian screw-driver is the result of an attempt to make it fit all sizes of screws and save the cost of several tools. But the blade very often contains enough of metal for half a dozen screw-drivers of all useful sizes which, with handles of suitable length, would meet all requirements.

OUR TRADE WITH ALASKA

Increase of Four Million Over 1913

Merchandise and treasure to the value of \$66,500,000 moved between Alaska and the United States in 1914, an increase of \$4,000,000 over 1913. Our shipments to Alaska last year, according to the Bureau of Foreign and Domestic Commerce, Department of Commerce, aggregated \$22,500,000, including approximately \$14,300,000 worth of manufactures, \$6,200,000 worth of food stuffs, and \$2,000,000 worth of gold, silver and miscellaneous materials, including foreign merchandise valued at \$500,000. As a market for our products Alaska, having a population of only 65,000, is of equal importance with China with a population of 336,000,000.

Alaska's great purchasing power is a natural corollary of its enormous resources, mainly gold, copper, fishery products, and hitherto undeveloped beds of coal and other minerals. In the period since 1867 Alaska has given to the world 250 million dollars' worth of gold, 183 million dollars' worth of fish, 65 million dollars' worth of seal and other aquatic fur skins, 20 million dollars' worth of copper, nearly 5 million dollars' worth of whale, walrus and fish oils, 2 million dollars' worth of silver, and whalebone, coal, gypsum, marble, tin and vegetables in sufficient sums to bring her total output to more than \$500,000,000.

This result has been achieved with a sparse population and an inadequate system of railway and other transportation facilities. With the new era of government railway construction recently announced by the Department of the Interior, the development of Alaska will be greatly accelerated and that territory, which already yields as much gold as the state of California, which produces half the world's salmon, and which includes a domain as large as our area east of the Mississippi River and an acreage for tillage several times that of those sections of Norway, Sweden, and Russia of similar latitude with 11,000,000 souls, may be expected to attain an even greater degree of industrial and commercial importance.

Alaska's commercial relations are chiefly with the United States. Shipments to the United States last year were valued at \$44,000,000. Canned salmon, \$18,000,000; Alaskan gold, \$14,600,000; Canadian gold, \$3,500,000; Alaskan copper, \$3,300,000; fresh salmon, \$750,000; seal and other fur skins, \$600,000; and miscellaneous fish and fish products, \$1,250,000 were the largest factors. Our purchases of fish and fish products from Alaska last year totaled \$20,000,000, or five times as much as imports of this class from Norway. Of salmon alone we bought from Alaska 200 million pounds in 1914, or an average of two pounds per capita.

FIRESTONE FACTORY ADDS TEN ACRES OF NEW FLOOR SPACE

The Firestone Tire and Rubber Co., Akron, O., has placed contracts for additional floor space amounting to 110,000 square feet (nearly three acres). This amount is in addition to the five wings begun last spring and which are now nearing completion. A total of ten acres of floor space has been added this year. When the additions above mentioned are completed the total floor space of the entire plant will be over 31 acres.

These new additions will allow an expansion in the tire output from 7,500 tires daily to 12,000 per day, an increase of 60 per cent.

Modern Business Tendencies*

By Adrian D. Joyce

It may seem a little strange that at this, a convention of business men, the subject under discussion should be of general interest. A little careful thought, however, will reveal the fact that modern business is coming to itself so rapidly that it's worth while to discuss its latest tendencies. We all know that in the old days to be in business meant to lose social caste. The very word "trade" is identical in its derivation with the words "traditor" and "traitor." The last half century has witnessed a tremendous right-about-face in the attitude of the world in general to those engaged in trade. This is due to the fact that those engaged in business have come to realize their obligations to each other and to the world at large. They have come to know that to be in trade is analogous with the phrase "to be of service" and surely there is no greater undertaking nor one bearing more honor or credit than that of being of service to one's fellow man.

There has grown up in the last decade in the minds of business men, at first dimly but now very clearly, the realization that every business must have its ideal. It was Emerson who said, "Every institution is but the lengthened shadow of a single individual," and the founders of business have come to realize that the world judges them by the ideals that they have been successful in instilling into their business.

One prominent business house has stated the ideal of their business as follows:

"To give the best service—better service than any other concern in our line has ever attempted to give. To make the best use of our equipment so that our product will deserve a world-wide reputation as the best that has ever been produced. To foster such pleasant relations between those employed in this business that harmony, happiness and success will prevail."

Surely business has come into its own when the ideals of an institution are seated in such terms.

Those business men engaged in manufacturing are making much of the "Quality" idea; they are realizing the great value of truth and truth telling as an effective agent in producing profits. We find manufacturers who are literally bending over backward in their efforts to tell the truth, the whole truth and nothing but the truth about the things that they manufacture. As a result there are today thousands of honest business men to one who is intentionally dishonest. Honest business is compelling honest business and is bound to do so or to go down in the struggle. It is not laws and legislation that is making business cleaner and fairer and better, but it's the knowledge of the power of truth that's doing the work.

In times aforetime business was regarded as a money mill—money was to be ground out of the business, come what might, but today men know that money is not all there is in life and they look upon their business not merely as a money mill or as a means of affording a livelihood, but as a good place to work in, as something that gives them joy and pleasure and as a thing that furnishes them the opportunity to give opportunities to their fellow men. This is shown by the great interest that is being taken in social betterment and the organization of service departments. The very fact that business men are giving attention to these important things appeals to the imagination of their clients.

Gerald Stanley Lee in his book called "Crowds," says:

"Success in business in the last analysis turns upon touching

the imagination of crowds. The reason why preachers in this present generation are less successful in getting people to want goodness than business men are in getting them to want motor cars, hats and pianolas is that business men as a class are closer and more desperate students of human nature and have bowed down harder to the art of touching the imagination of crowds."

So we see that the doing of good things in business really is an active agent in producing profits because it appeals to the imagination of humanity. Business men have come to know that they must conduct their business so that it may be open to the searchlight of publicity—so that there may be no secret hiding place where wrong dealings or evil practices may be accomplished—and business men, perhaps more than any other class of men, have come to know that the real pleasure of making money is to be able to give money. They have come to know that when the time comes when each of them shall go "to that bourne from whence no traveler ever returns," the only things they can take with them in their cold dead hands are those things which they have given away.

Modern business has all the attributes of a human mind, for, after all, it is men—human beings—who are developing it and who are directing its progress. Just as you and I and all of us are trying to make of ourselves better men and better citizens, so our businesses are trying to make of themselves, because of the human factor, better and more efficient instruments of service.

In these days when more than half the world is engaged in a brutal and degrading struggle, in these days when one's hopes of civilization and of the millennium are becoming much upset, let us who are engaged in the constructive work of business resolve that we will co-operate one with the other to bring into the minds of all those engaged in our craft a fuller and more complete realization of the fatherhood of God and the brotherhood of man.

Let us make all modern business the efficient instrument of service that we would have it to be, let us recognize and reward efficiency, let us realize that modern business is not a cut and dried science as someone has said, and that it cannot be run by any rule of thumb system; let us look for men and develop men who will carry out to its ultimate conclusion the business ideals of the best business men of this era.

It's a fine thing for the head of a business to put in definite and specific form the ideals toward which its institution is trending. In our own organization we have codified our ideals into what we call our "Code of Principles." These are as follows:

1. To win on our merits.
2. To be the best and largest concern of the kind in the world.
3. To be broad and liberal as well as aggressive in our policy and methods.
4. To take a pride in our institution.
5. To be loyal to the company and to each other.
6. To foster good fellowship among ourselves and to take pleasure as well as profit out of our work.
7. To strive constantly for the improvement and advancement of the business and ourselves.
8. To be considerate, polite and courteous in all of our dealings within and without the company.
9. To be high-toned in everything everywhere.
10. To grow in knowledge and character as well as in size.

We well realize that if we can inculcate these ideals in the minds of those who are working with us, we will not only achieve the end toward which we are aiming, but we will make

*Delivered at the convention of the Carriage Builders' National Association, held in Cleveland, O., September 21-23, 1915.

our business most efficient, for efficiency is really "making the most of the business by making the most of one's self."

We are trying to instill into the minds of every one of our staff the basic idea of merit, for, as has well been said, "Merit begets confidence, confidence begets enthusiasm, and enthusiasm conquers the world."

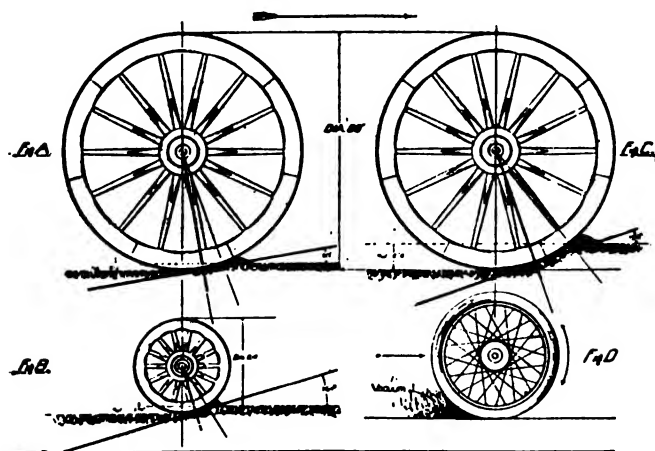
In the pursuit of the attainment of some of the ideals which all good business men cherish, let us go forward as the crusaders of old—let us crusade for a holier cause: the ideal business methods. Let us emblazon on our shield the magic word "truth," let us work for it and live for it. It is the most comprehensive word in our language and indicates a clean, perfect and wholesome purpose that will redound to the glory and honor of all its devotees.

TRACTION

Major F. E. Stowe, C.E., recently delivered an address on "Traction" before the Institute of Local Government Engineers of Australia.

Major Stowe referred to the antiquity of the wheel, which he described as the most important simple mechanical form in use among civilized peoples. Eliminating axle friction, it should, as a means of moving loads, give 100 per cent. efficiency, but owing to the compressive force of the load sinking the wheel into the road efficiency was always less. From this, the importance of good roads was deduced. Resistance to road traction was due to the wheel continually rising on the incline found in front of it, and, on the principle that the work done in drawing a load over a grade is equal to the weight of load multiplied by height lifted, the resistance to a wheel over a road was equal to the tangent of the angle of the incline of the depression made in front of the wheel, multiplied by weight of wheel and load.

For a wheel 5 ft. in diameter, which sinks into the road $1\frac{2}{3}$ in., the tangent of the angle in front is .176, and if wheel and load weighed one ton the force required to draw the wheel would be 2,240 lbs. \times .176, or 394 $\frac{1}{4}$ lbs. plus friction. If it



sinks 6 inches, the tangent of the incline is .354 (793 lbs.). For a wheel 2 ft. in diameter sinking $1\frac{2}{3}$ in. the tangent is .296 (663 lbs.).

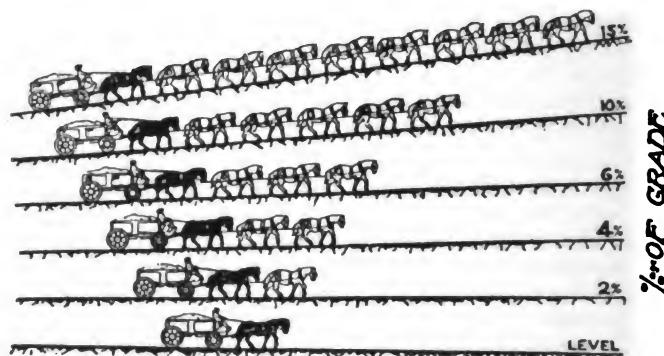
Axle friction is due to contact of the surface of the axle box on the axle, in the same way as the runners of a sledge make contact with the surface of the ground; but, compared with the sledge, it is reduced by the difference in the diameters of wheel and axle respectively. By using a wheel 48 inches high on a 2 in. axle, and assuming friction to be constant, efficiency is increased 24 times in comparison with a sledge; that is because the diameter of the axle is $\frac{1}{24}$ th of the diameter of the wheel. Halve the height of the wheel and you double the axle friction (diameter of axle being constant). Taking two wheels, 4 feet and 2 feet in diameter respectively, on 2 inch axles, and

co-efficient of friction .1, resistance to traction for the 4 ft. wheel would be 9.33 lbs. per ton, and 18.66 lbs. per ton for the 2 ft. wheel.

Usual co-efficients of tractions are given as:

For railways	9 to 15 lbs.
For asphalt	20 to 26 lbs.
For wood	24 to 30 lbs.
For stone pavement.....	30 to 40 lbs.
For inferior stone pavement.....	50 to 60 lbs.
For macadam, good.....	50 lbs.
For macadam, bad.....	60 to 70 lbs.
For macadam, soft.....	80 to 90 lbs.
For gravel	158 to 200 lbs.
For arable land.....	200 to 300 lbs.
For soft ground.....	300 lbs.

From the point of view of the owner of the vehicle, a large wheel, within limitations of convenience, is essential. It is also important to road owners. The tire sinks into the surface of the road until the latter is compressed sufficient to give the necessary area of contact to support the load. The flatter



curvature of the high wheel gives the needed support with less sinking than a small wheel requires. This is of as great, if not of greater, importance than the width of tire, because a wider tire only extends the theoretical line, and after the surface has been compressed, the width gives a bearing surface in proportion to its width.

The use of "spud" or wheel bars should be a subject of legislation. On self-propelled vehicles the tire should be "roughed" only sufficient to insure depressions in surface of road being of minimum depth, and they should be staggered across the face of the tire transversely.

Resilient tires created a vacuum behind the tire, which sucked out the binding. In America crude mineral oil or bitumen distillate, a product of mineral oil, was widely used.

The influence of grade on roads was strikingly illustrated by a diagram adopted from an American source.

In conclusion Major Stowe urged that there should be a minimum diameter fixed for wheels. No wheels with "spuds" should be permitted, and tires should be uniformly proportional to diameters and proportional to loads to be carried.

Main roads should be divided so that fast traffic is carried on a bitumen or other plastic surface, while heavy and slow-moving traffic should be carried on a concrete or macadamized surface. Grades should be reduced wherever possible.

BUCKEYE WHEEL WORKS FOR SALE

A large banner on the east side of the main building announces that the plant of The Buckeye Wheel Co. is for sale.

This is the first intimation that the property was actually in the market, although the works shut down several months ago, and much of the machinery and material has been removed. Mr. White, president of the company, has been here from Ft. Wayne, Ind., a number of times since the factory shut down.

John Schnelkner, foreman of the shops, is in charge of the property.—Galion (O.) Inquirer.

The Horse Industry*

By G. Arthur Bell, of the Bureau of Animal Industry,
Washington, D. C.

The subject which has been assigned to me is a big one and one which is concerned with a big industry. In fact, the horse industry is really one of the greatest industries of the United States. I say one of the greatest industries, because of the close relationship which it bears to successful and economical agricultural production, because of the relationship which it bears to our various transportation problems, and also because of the magnitude of the industry itself. The latest figures which we have for horses in cities is that of the 1910 census. That census gave the number of horses in cities as more than 3,000,000. That was an increase of more than eight per cent. from 1900. In spite of the advent of the automobile, horses in cities increased more than eight per cent. from 1900 to 1910. Now, there is no reason to believe that there are fewer horses in cities today than there were in 1910. On the surface it might appear that the number of horses in cities has actually decreased, but I think it is safe to say that 50 per cent., perhaps 75 per cent. of the men who own automobiles today never owned a horse. We will assume, therefore, that the number of horses in the cities today is 3,000,000. Now, there may have been a slight decrease of horses in some of our eastern cities, such as New York, Philadelphia, Baltimore and Washington. This, however, has been more than offset by the increased number of horses in the cities of the west, the growing cities, because of the increased amount of business.

Now, we have later figures for the number of horses on farms. The Department of Agriculture through its Bureau of Crop Estimates is able to give a pretty accurate estimate of the number of horses on farms in the United States. The total number on January 1, 1915, was over 21,000,000. That is an increase of more than ten per cent. during the past 15 years. This makes a total of more than 24,000,000 horses in the United States. Now, this increase of ten per cent. during the past 15 years is not simply an increase from 1910 to 1915, but a steady gradual increase. The increase from 1910 to this year is five per cent., and there has not been a single year during that time that the number of horses has not actually increased in number. Our cattle, our sheep and our swine have decreased more than ten per cent. in the last 15 years.

The demand for the increased number of horses on farms can be assigned largely to two factors: the increased amount of cultivated land, and the increased use of machinery. The high cost of farm labor has made it necessary for the farmer to make a greater and more efficient use of farm machinery, and that has meant a greater number of horses. In spite of increase in the number of horses, they have increased in value per head over 100 per cent. in the past 15 years. In other words, horses are worth double per head today what they were 15 years ago.

In addition to our 24,000,000 horses, we have over 4,500,000 mules. The total value of our horses and mules is over \$3,250,000,000. Horses and mules constitute in value 50 per cent. of the total value of our live stock.

The Automobile Trade Journal for June, 1915, gave the estimated number of automobiles and motor trucks as 1,707,000. These figures were taken from state registration accounts for 1914, and included machines licensed in more than one state. We will assume, however, that that number is approximately correct. Let us for a liberal estimate add 300,000 to this number for the additional machines of 1915. This makes a total

of 2,000,000 automobiles and motor trucks in the United States. That means that there are twelve horses for every automobile and motor truck in this country. This certainly does not indicate that we have reached the horseless stage, about which we hear so much. Now, I am not saying this in disparagement of the automobile, both for pleasure and for business purposes, but merely to point out the fact that we have not reached the horseless stage.

Now, let us return to a consideration of the relationship of the horse to agricultural production. There is, in my estimation, no factor of greater importance in the production of agricultural products than getting efficient horsepower. Without good, efficient work horses farming cannot be done as economically as it can with them, and these horses are needed to offset the increased cost of labor. We have in the United States more than 6,000,000 farms, which means that there is on an average not more than four mature working animals per farm. We hear a great deal of the displacement of horses by motor trucks. You will all realize that there is not much danger of displacing any large number of these horses by motor trucks when the average farm has not over four work horses. The motor truck, to be an economical factor in agricultural production, must displace more than four horses. If the average farm does not have more than four horses, how is the motor truck to displace them? There is always some kind of work on every farm for which it is necessary to have horses. Much of our farming land is wet, low land, and the motor truck would get stuck, and it is therefore necessary to have horses.

The Agricultural Department made a very careful survey of the motor truck, and found that in most cases it had not displaced horses to any extent.

In spite of the fact that good horsepower on the farm is of such great importance, the breeding of high class horses has been given less attention than the breeding of any other kind of live stock. The breeding of horses is a side issue on the farms to a greater extent than is the breeding of any other live stock. There are many reasons for this. The main reason is that the majority of the horses in this country are produced by our farmers. The farmer really cannot keep a good stallion for the number of mares he has, whereas in the production of cattle or sheep the farmer usually has a sufficient number of females to keep a good bull or a good ram. The result is that in many of our sections there are no good stallions. Many foreign governments have recognized the necessity for good horses and have appropriated large sums of money for their production. Notably among such countries are Germany, France and Austria-Hungary, each one of which appropriates a million dollars a year for encouragement of horse production. Our own government has not seen the necessity for work of this kind until recently. It has, however, made small appropriations for a few years to be used by the Agricultural Department. This has enabled us to take up three main lines of work. One is the production of the general purpose horse in co-operation with the Colorado Agricultural Section. In that work we are using nothing but the horses that weigh from 1200 to 1,400. Such horses, we believe, are going to be the most useful for the average farm. They are heavy enough to do the average work, and at the same time, the farmer can use them for driving purposes. Another line of work has been that of the regeneration of the Morgan horse, which we are doing in the state of Vermont. Most of you realize that the Morgan horse has been one of the most useful horses in countries like the New England states where the most of the land is rough and hilly.

*Delivered at the convention of the Carriage Builders' National Association, held in Cleveland, O., September 21-23, 1915.

We are endeavoring to encourage the production of the Morgan horse in the New England states. Another line which we have taken up but recently has been the production of horses suitable for military purposes. In 1913 an appropriation was made for this work, and we purchased about 40 good stallions of the light breed. We have sent those stallions into sections where there are a number of good mares but very few good stallions. In that work we not only keep in mind the necessity of horses for the army, but the necessity for good horses of the type of horse needed by the farmer. It has not been the purpose of the Department to enter into competition with the farmer in connection with the production of horses, but it has been our purpose to encourage the farmers to purchase horses for their own use.

We have gone, as I say, into those sections where they did not have good stallions, and this gives the farmers an opportunity to breed their mares to the highest class stallions in the country without any charge for service fee. The farmer gives the government an option on the colts when they are three years of age, at a price of \$150. If, however, the farmer wishes to cancel this option, he may do so by the payment of a service fee of \$25. In other words, if he gets a colt that he wants to keep for his own use or something that he can sell for more money than he can by selling to the government, he can cancel his option by the payment of the service fee. That may seem to be a rather one-sided affair in favor of the farmer, but it is not. It simply encourages the production of better horses, and if the War Department needs them in case of war, they are in the country and can be gotten, if the price is paid. This line of work is of particular importance at the present time because of the foreign demand for army horses. Since the war began there have been exported about 400,000 horses and over 100,000 mules. This has led some people to think that we are in danger of a shortage of horses, but such I do not believe to be the fact. This 400,000, as you will realize, represents less than two per cent. of the total number of horses in this country, and these horses that have been exported, for the most part, have been a common ordinary lot. Of course, there have in this 400,000 been a few good ones, but most of them have been the surplus horses which the farmer has not needed and which he has found impracticable for his work, and he has been fortunate enough to sell them to the foreign governments. This demand for export horses will probably continue for a great many years, and even after the war is over, because of the shortage of horses that will occur among the warring nations. It is estimated that there are approximately 100,000,000 horses in the world. Of this 100,000,000, the United States possesses 24,000,000, or practically one-fourth. The United States and Russia together possess over 50 per cent. of all the horses in the world, Russia being the only country which has more horses than we have. It can readily be seen, therefore, that, with the exception of Russia, the other countries now at war are bound to be short of horses for work purposes. Russia will probably have enough for her own use, but on account of the great number that are being killed in Russia today, she will probably not have any for export. That means that the other countries will have to turn to the only other big horse producing country, the United States. I think, however, that we should be able to meet this export demand. We are producing annually more than 1,500,000 colts. If this demand continues it will, of course, mean that the prices of horses will increase, but I do not think they will go abnormally high. As soon as horses become much higher than they are today, it will simply mean that there will be greater use made of motive power in the cities, and the city horses will be thrown upon the market. It will, however, mean that the farmer will get a good price for his horses for several years.

The demand for horses for city use, however, takes on another aspect. We will have to look the situation straight in the face and admit that the automobile has hurt the demand for pleasure horses for city use. It will probably also hurt the demand among the farmers for horses for road purposes, for as our

roads become better and better, our wealthier class of farmers will make greater and greater use of automobiles. But the average farmer will have to depend on the horse for a great many years, not only for road purposes but for general purposes. There is a certain class of horses in cities for which I think there will be a slightly increased demand, and that is the high class carriage horse. Among people who can afford both automobiles and horses, the high class carriage horse has an individuality that cannot be given to the automobile, and for those people who wish to attract attention of that sort, the demand for high class horses will probably increase. This demand, however, will necessarily always be limited. Another class of horses for which there is likely to be an increased demand is the saddle horse. So far as the demand for carriages and buggies and saddles and things of that kind is concerned, you doubtless know the conditions much better than I do, but it is not likely that there will be any greatly increased demand for them. There will be, probably, a slight increase for the real high class carriage, but I believe the carriage builders will have to depend largely on the small farmer who demands a medium priced buggy.

I have endeavored to show that our horses have not reached the place where there is not a demand for them; that our horses have increased in number, and that we are not likely in the near future to say "good-bye, horse," or to think that we have reached the horseless age.

WILL NOT DISCONTINUE BUGGY BUILDING

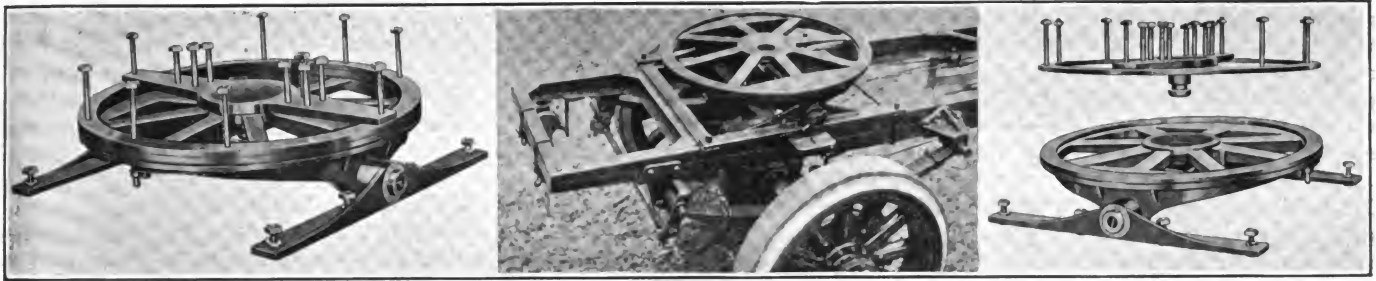
The Banner Buggy Co., St. Louis, Mo., has authorized the following statement:

Our Mr. Gardner has accepted the presidency of the Chevrolet Motor Co. of St. Louis—a company which is going to build automobiles. We beg to state to the buggy trade and horse-drawn vehicle users that this in no manner interferes with the business of this company. The buggy is here to stay. We don't believe it will ever be displaced altogether by the automobile or motor car. It is true, of course, that the automobile has made inroads into the horse-drawn vehicle industry, but this company is doing a large business at this time—has had a very successful and prosperous year, and beg to advise our customers that under no circumstances will we discontinue building buggies.

The Banner Buggy Co. will go on forever—continuing to fill the wants of our customers in the best manner possible—furnishing a medium-priced buggy at the lowest possible price, and in other words, continuing the well known policy that has made the Banner buggy famous from ocean to ocean."

CHEVROLET MOTOR CAR EXPANSION

The Chevrolet Motor Company of Delaware, a holding company for the Chevrolet Motor companies of New York; Flint, Mich., Tarrytown, N. Y., and Toronto, Canada, has been incorporated with a capital stock of \$20,000,000. Announcement has been made by William C. Durant, president of the company, that plans provide for a manufacturing center at Flint. The plants of the Mason Motor Co., which manufactures motors for the company, and of the Walker-Weiss Axle Co., which makes its axles, both at Flint, will be greatly enlarged and their present output of parts for 200 cars a day will be practically doubled. The statement has been made that 60,000 cars will be manufactured in 1916 by the present enlarged plants, and in 1917 plans call for 200,000 cars to be produced at various assembling plants in a similar manner to the Ford plan. Assembling plants will be established at Oakland, Cal., and St. Louis, Mo. Russell E. Gardner, of the Banner Buggy Co., has arranged to incorporate the Chevrolet Motor Co. of St. Louis, with a capital stock of \$1,000,000. A. B. C. Hardy is general manager of the new Delaware corporation.



The Martin patented rocking fifth wheel: At left, the complete assembly; at center, installed on a truck chassis; at right, the sections separated

INGENIOUS ROCKING FIFTH WHEEL DEVICE

Obtaining the fullest value of normal motor vehicle traction or haulage capacity, so that the load may be doubled without increasing the fuel consumption or lessening the speed, and without materially increasing the expense, has been the purpose of every progressive engineer and designer. Originally the main object was to construct large units, but experience taught that the operating expense was generally proportionate to size, and unless full loads could be carried at all times these vehicles were not economical, or at least could not be operated with sufficient saving to justify investment.

Attention was diverted to smaller machines, limited as to loads, but having more speed. With these the limitations of size impelled fast driving, with the consequent destructive wear. There were those who sought to adapt trailers, with which there were disadvantages so far as handling in traffic or narrow streets, and there are few trailers that are so designed that they will endure the peculiar stresses when hauled by a tractor.

Several engineers have developed trailers that are practical in construction and which can be hauled with absolute control, but no system of braking the trailers has as yet been developed and backing is not practical, so that what may be regarded as satisfactory trailer trains for road tractors have not been perfected, although some very finely designed tractors have been produced that have been remarkably economical in service.

Tractor and Trailer Development

The development of tractors and some forms of trailer equipment has been the work of Charles H. Martin for a number of years, and he was one of the first, if not the first, engineer to

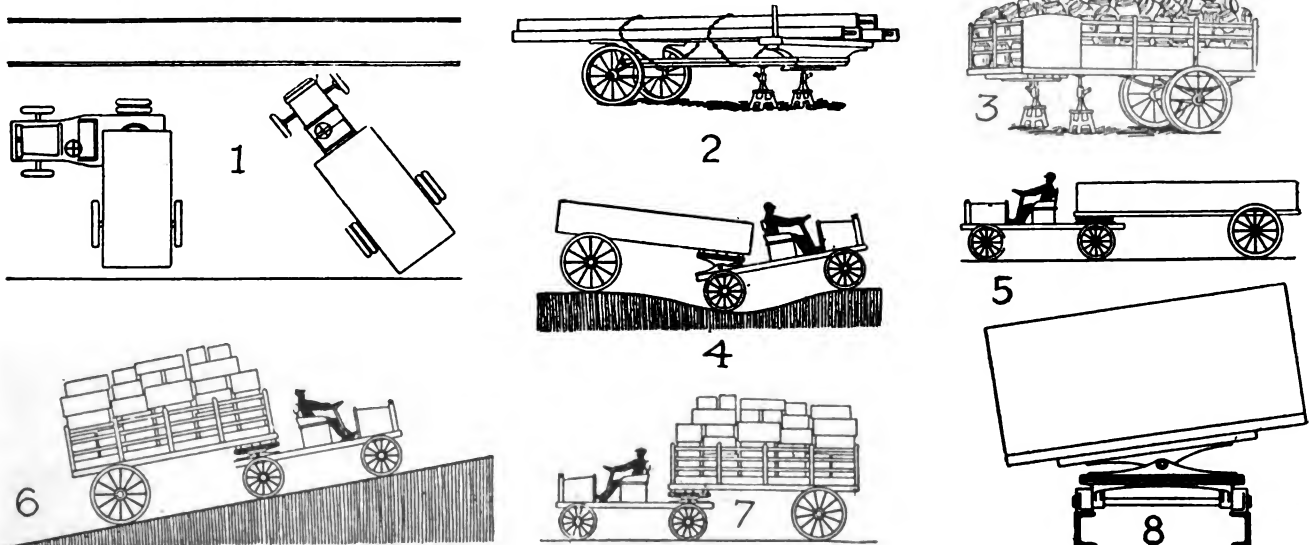
realize and investigate the need of special means of coupling a trailer body to a tractor when the equipment is what is known as the semi-trailer—that is, the tractor has three or four wheels for steering and propulsion and draws a body mounted on two wheels, the forward end being carried by the tractor.

His investigations, which have been amply proven by tests and trials of others, have established that the average vehicle designed and built for freight carrying can draw a much larger weight than can be placed on the carrying platform, unless the load is metal or some other equally heavy material, and that in what may be regarded as normal haulage conditions that the practical freight can be estimated as double the capacity rating. That is, a ton truck engine has adequate power to haul two tons, although the vehicle ought not to be overloaded. To utilize this power the trailer or the semi-trailer equipment is necessary.

Doubles the Freight Capacity

This haulage power as compared with actual freight carrying can be applied to every form of transportation, either manual, animal or vehicular, and the practical adaptation of this power has been the problem that Mr. Martin has studied. In every experiment or service a more satisfactory and economical equipment has been obtained by utilizing the hauling power of the vehicle and by carrying the freight in a semi-trailer. Having a two-ton load capacity truck good judgment demands that it be loaded to its rating and no more; that it be driven to a normal speed and not faster. To exceed either the load or the speed means probable damage and perhaps quick deterioration.

But with a semi-trailer body with capacity for four tons, so



Utility of the Martin fifth wheel: 1, semi-trailer occupies less street space; 2, body loaded with lumber jacked ready for truck; 3, trailer loaded during the absence of the truck; 4, hinged connection eliminates vehicle strains on uneven surfaces; 5, truck and semi-trailer can be backed perfectly; 6, truck carries sufficient load to have full traction; 7, half of load carried by truck; 8, unstabilized effect of body having longitudinal hinged connection.

designed that not more than half the weight of the freight is carried on the truck and the other half is carried on springs on a dead axle, with the wheels shod with solid metal tires, a load double the normal can be hauled at practically the same speed. With this the fullest measure of usefulness of the unit is obtained. It has the mobility, the ease and certainty of handling, the economy and the reserve utility of the truck, and despite the double freight the cost of tires is not increased. The outfit can be handled in traffic and in narrow highways, can be backed with absolute certainty, and it can be worked with several bodies that may be loaded and unloaded while the truck is doing haulage work.

The Martin Rocking Fifth Wheel

The coupling of the semi-trailer to the truck is of great importance, because the forward end of the body must be carried so that it will have perfect stability on surfaces that are not level, so that the truck may be turned in any direction and have the same support, and so that when the truck and the body are at different angles with reference to the plane of movement the support shall not be weakened. This coupling is made with the Martin patent rocking fifth wheel, a fitting that can be installed on the rear of the frame of any truck and the machine adapted for the greatest economic use.

The Martin fifth wheel converts the truck so that it serves exactly the same purposes that a team of horses, pole, front axle and wheels serve with an animal truck. In this case the truck carries what is often known as turntable. There is a pair of brackets that are either bolted or clamped to the frame, and which support the trunnions of a circular bed, which resembles a wheel. What might be termed the hub is an opening with depressed edges, so that engagement may be easily made. The upper section of the wheel is a circle with a heavy bisecting plate that carries a heavy stub or pivot in the center that drops into and engages with the central opening of the lower portion of the wheel. This upper half is bolted to the frame or bolsters of the trailer body.

With the ordinary wagon turntable the forward axle may be turned in any direction, but in the event of variance in the surface of the highway one section of the circle may support the body. The king bolt, which corresponds to the wheel stub, sustains the draft stresses. With the Martin fifth wheel the trunnions of the lower section allow a longitudinal movement of the body for the truck, so that there is no strain upon either, although the support of the load by the truck is not varied, and the transverse or crosswise stress that may result from turning, or when on crowned highway surfaces, is compensated by the truck springs.

This fitting is designed for heavy service and there is no reason for its adjustment and it requires absolutely no attention. The lower part of the fifth wheel can be bolted or clamped to the truck or vehicle frame, so that it may be quickly removed, yet it will not be less efficient. In the event of several bodies being used as many upper sections as are necessary can be permanently attached to the bolsters or frames and when desired a truck can be used for as many different services as there are special semi-trailer bodies.

Conversion of Bodies Very Simple

The means of conversion are extremely simple. Unless the body is very light a pair of jacks for each unit is desirable, for this obviates the use of wooden horses or other means of supporting the forward ends when the truck is withdrawn, but when the bodies are to be loaded while standing more substantial supports are needed to insure against them dropping should they be struck violently. With a jack placed at either side the end of the body is lifted so that the stub of the top half of the fifth wheel is clear of the lower half, and then the truck can be driven away.

With semi-trailer equipment passenger or freight carrying vehicles are possible, and the trailers may be long or short wheelbase, end or bottom discharging—in fact any type of equipment where large capacity is essential.

While the statements may be applied to trucks in general, the Martin fifth wheel can be used with a Ford chassis, so that with a trailer the vehicle shall have a load capacity of 1,500 pounds, and this is designed to be attached with clamps so that the change can be quickly made from passenger to freight carrying and without the use of special tools.

The Ford equipment is built with an 18-inch circle and sells for \$25; for the trucks of from one to three tons capacity it has a 32-inch circle and sells for \$80, and for four to five-ton trucks with a 36-inch circle, selling for \$90. Extra upper circles are supplied at the respective costs of \$3, \$8 and \$9. Wagons can be converted for use with this equipment, but better results are generally obtained with heavier wheels and axles because of the heavy strains upon them.—Motor Truck.

COUZENS RESIGNS FROM FORD CO. BECAUSE OF PEACE PROPAGANDA

James Couzens, vice-president, treasurer and general manager of the Ford Motor Co., resigned October 12 from all active connection with the Ford organization. The reason given is that he could not agree with the public utterances of Henry Ford on the national question of peace and unpreparedness.

Mr. Couzens' resignation comes as a sequel to the division between Henry Ford and the Dodge Brothers, which resulted in the starting of the Dodge factory over a year ago. It has been understood that there have been differences between Couzens and Ford for several years, these differences dating to some time before the Ford announcement of his profit-sharing plans, and also before the break with the Dodge Brothers.

Mr. Couzens' connection with Henry Ford dates back to the early part of 1902 when he first met Ford and became interested in the building of a sample car. Couzens, Ford and another associate followed the development of this particular sample, or experimental car until the spring of 1903 when they set about to form the present Ford Motor Co., which was organized in June of that year, and Mr. Couzen became business manager and secretary.

In the Ford organization it has always been recognized that Henry Ford was the man who was responsible for the early cars of 1902, as well as practically all models and designs of the company since, but that James Couzens has been the organizing, business, and financial moving spirit of the concern. The extent to which Mr. Couzens has profited from the Ford organization is practically indicated last June when the directors of the company increased the capital stock from \$2,000,000 to \$100,000,000, and when it was announced that Mr. Couzens received 1¼ per cent. At that time when the \$48,000,000 new stock was distributed among the eight stockholders as a dividend, Mr. Couzens share was \$4,800,000.

Frank Klingensmith succeeds James Couzens as vice-president, general manager and treasurer of the Ford Motor Co. Before his promotion Mr. Klingensmith was secretary of the company, a position in which he is succeeded by Edsel B. Ford, Henry Ford's son, who is barely past 21. The amount of Mr. Klingensmith's present salary has not been announced.

His holdings of the company's stock have made him wealthy. His rise is like that of Henry Ford's other partners in the business which has returned so many millions to its projectors.

Mr. Couzens, who originally invested \$2,500 in the Ford company, is enormously wealthy. He retains his financial interest in the company—estimated at from \$50,000,000 to \$75,000,000—with which he had been associated 13 years.

AUTOMOBILE COMPANY FOR NEWPORT, MICH.

The Francisco-Martin Motor Co., Newport, Mich., has been incorporated with \$30,000 capital stock to manufacture automobiles. The incorporators are G. W. Francisco, L. J. Martin and F. B. Scholl. It is stated that the company will erect a factory at Newport.

THE TREND OF AXLE CONSTRUCTION

In reviewing the progress on front and rear axle construction during the last few years, most notable is the advancement of worm gearing as applied to heavy vehicle propulsion, the chain drive is almost passe. Double reduction and internal drive axles have not kept pace in this field. The worm drive now promises to become increasingly popular on the pleasure car, due to the advent of small bore, high speed motors, necessitating unusually low gear reduction, barely practical on skew bevels and unthought of in the side chain or double reduction application to the pleasure car field.

Worm Gearing for Pleasure Cars

With attainable engine speeds, in the near future, of 2,500 r.p.m., 6:1 reduction is not extreme. It is much easier to produce a perfectly satisfactory worm gear axle with greater ground clearance and lighter weight than with any other known design, and before long we prophesy that the worm gear will have made quite an inroad on pleasure car requirements. The remarkable results obtained in the commercial car by the worm drive axle is really accountable for its popularity, and considering the many diversified forms as presented by different manufacturers, we are led to believe that this form of drive is much more rugged than generally supposed by most engineers, and the mystery attached to this construction is fast becoming a thing of the past. Its extensive application, however, may have a setback if the gears are improperly mounted, and even with a very wide experience with conventional design, the question of proper bearing clearance, center-to-center distances and tooth forms promise interesting study for engineers, without reverting to untried methods of mounting, which, while they may be durable, can never be as efficient.

Semi-Floating Construction

Quite in line with the progress of worm gear axles, the semi-floating construction has kept pace. This form of drive holds forth great promise of being the only design from a cycle car to a five-ton truck. Its real merit is at last becoming more widely known. In the early days, it had an unfortunate setback on quite a few cheap cars where the sections, material and treatment were totally inadequate for their work. Where the combined bending and torsion are well taken care of, there is no more satisfactory axle from any viewpoint. It is also gratifying to note the present tendency not only to larger brakes, but more efficient ones. However, there are still engineers who believe that it is not possible to obtain sufficient braking area on the rear wheels alone without resorting to the propeller-shaft brake, particularly in the heavy vehicles. It is a known fact, however, that double brakes on the rear of a five-ton truck can be made just as efficient as any propeller-shaft brake without its attendant increase in stress throughout all the propulsion members. These members should be designed to suit a certain known bore and stroke with a definite output rather than forces coming from the road wheels which are usually from two to three times as great as from the engine, and are never as easily controlled—subjected always to overloading, and road irregularities.

There is then again the question of which type of brake is best. Personally, says Mr. A. M. Laycock, of the Sheldon Axle & Spring Co., writing in the *Automobile Trade Journal*, the writer is of the opinion that no one type of brake can be made to fit each condition, and prefers at all times the cam brake for light work, pleasure car or light commercial trucks, but in heavy chassis work, this form of brake is quite out of place, and some form of self-intensifying or toggle acting brake must be used.

Does Not Believe in Pressed Steel Housing for Truck Axles

At the present time, quite a little thought has been put on pressed steel housing for heavy commercial vehicle work. In the writer's estimation, with our present knowledge of operating these extreme loads on solid tires, the cast steel housing

with pressed in tubes or the large one-piece steel casting is very hard to beat. The pressed steel housing has certainly a place in the pleasure car field, but in the writer's estimation quite out of order in the three or five-ton class.

Considerable attention is being given to the application of ball bearings for wheel work on these very heavy constructions with surprising results.

Driving Through the Springs

It is also well to note the very strong tendency toward driving through the springs as compared to the radius and torsion rods. This is certainly a step in the right direction, as it not only eliminates the number of additional parts with their attendant wear, rattle, etc., making possible a very rigid connection to the axle itself as compared to the swivel seats, etc., but it is also theoretically right where good straight flat springs are used, giving a uniform velocity to the worm instead of a series of hammer blows where the torsion member is used.

These last few years have not developed anything very startling in the front axle field, but there has certainly been a marked improvement in detail with regard to the increased pivot bolt sizes, cutting down the unit pressure per square inch—heavier spindles, which are invariably made from alloy steel, thoroughly heat treated—larger clevis pins, and more attention has been paid to the lubrication. However, it has taken engineers a long time to appreciate the importance of giving the front axle more attention with regard to material and sound workmanship and it is really gratifying to note the absence of failure of these parts at the present time, which, in so many instances ended so disastrously. Judging from the varied constructions as at present used in heavy motor truck axle equipment, the writer is led to believe that this next three or four years will show a decided preference for either one or the other construction, and judging from present tendencies the worm gear has the lead and it's a question of the "survival of the fittest."

KANSAS CITY CONVENTION DATES

The Western Retail Implement, Vehicle and Hardware Association will hold its convention at the Century Theatre, Kansas City, Mo., January 11, 12 and 13. The board of directors was in session at the Coates House, September 27, to formulate the program. Officers and directors attending follow: G. W. Collins, president, Belleville, Kas.; H. J. Dodge, secretary and treasurer, Abilene, Kas.; E. C. Hood, Pittsburg, Kas.; W. T. Osborn, Gallatin, Mo.; E. C. Waldo, Ellis, Kas.; W. A. Carrington, Wellington, Kas.; M. M. Smith, Clay Center, Kas.; Charles Kenison, Kansas City; George H. Brett, Ponca City, Okla.; H. D. Skinner, Braymer, Mo.

A "MADE IN PITTSBURGH" CAR

Elmore E. Gregg, well known to many automobile men over the country, is the head of a new company of Pittsburghers formed for the purpose of manufacturing low priced touring cars and roadsters. Options have been secured on two factories having a yearly capacity of approximately 10,000 cars. There will be just two types of car produced—a roadster and a touring car. Each will have the latest features, with some new ones.

GOOD ROADS—GOOD PROFITS

Mr. Alfred O. Dunk, of Detroit, Mich., says "a recent report furnished by the U. S. Department of Agriculture furnished the astounding proof that the farmers of the United States are losing annually \$250,000,000 for the reason that they are unable to get to market at certain times of the year owing to bad roads conditions. All over the Union are counties rich in agricultural products—but bearing the burden of bad roads.

RENTAL PLAN FOR ELECTRIC VEHICLES

Our readers will be interested in learning of the plans recently formed by Thos. A. Edison and the Ward Motor Vehicle Co. at a special meeting in the Edison laboratory, Orange, N. J., September 20. There were present Thomas A. Edison and his representatives; C. A. Ward, secretary-treasurer of the Ward Motor Vehicle Co., and the electric light and central station engineers of New York and New Jersey. After an inspection of the Edison plant and method of building the Edison storage battery, luncheon was served, and the details of the plan were outlined by Mr. Ward and H. G. Thompson, vice-president and general manager of the Edison Storage Battery Co., and other speakers.

Briefly, the scheme put into effect is as follows: The "Ward Special," a light electric truck of 750 lbs. capacity, manufactured by the Ward Motor Vehicle Co., has been fitted with a special G-4 Edison battery of 65 cells, and sold to merchants whose credit is satisfactory, on a small payment upon signing of the contract, another slightly larger payment upon delivery of the vehicle and a monthly payment thereafter. The total cost of the vehicle is to be \$875, although fitted with this battery the selling price is ordinarily \$1,350. The unique part of the plan is the fact that the Edison battery is virtually rented to the purchaser, the title remaining with the Edison Co. The first year's rental is included in this price of \$875, and the rental per month, beginning with the second year for the charging and use of the battery in the vehicle, is but \$10.50. The battery is guaranteed for four years. This battery rental is based on a maximum of 25 miles per day, or 650 miles per month. If operated in excess of this distance there is a charge of 1¼ cents per mile. The vehicle is fitted with a sealed hub odometer and readings will be made by the inspection men.

The Edison Co. gives the battery its monthly inspection and maintains the battery in proper condition at all times. Under these circumstances the battery should last indefinitely, as even with abuse it is claimed that the Edison battery will last from six to eight years.

Tires Cost Less Than Shoeing a Horse

A cost of but four-fifths of a cent a mile is guaranteed for tire upkeep and by actual experiments the manufacturers claim that this is less than the cost of shoeing a single horse when working in similar service.

Arrangements have already been made with some 50 livery stables in New York to garage the cars at \$10 per month, so that the total cost per month of the car keep and current will be approximately \$20, which is less than the board and stable of a single horse and wagon. At least ten years of life is claimed for the car, as against five years for the average horse in city delivery work.

The car weighs, complete with battery, 2,500 lbs., is equipped with Westinghouse motor, Timken bearings and Firestone solid tires. The single motor is under the center of the body, and drive is by shaft to a bevel gear rear axle. The battery is carried in a box under the driver's seat, and the car is very simple to operate.

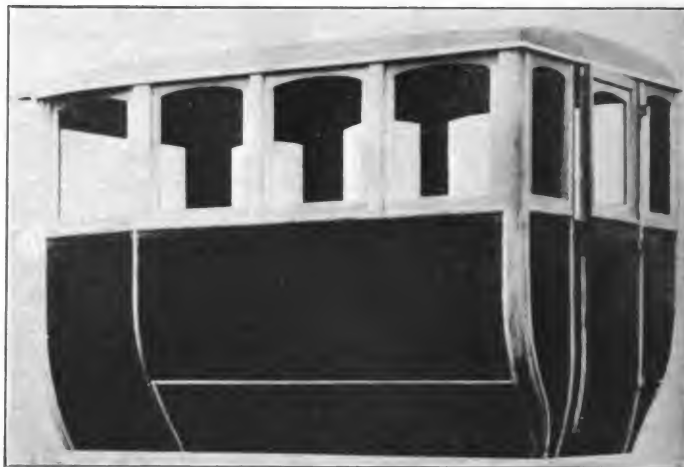
The meeting was attended by representatives of the New York Edison Co., United Electric Light and Power Co., Edison Electric Illuminating Co. of Brooklyn, Electric Department of the Flatbush Gas Co., The New York and Queens Electric and Power Co., and the Public Service Electric Co. All of these concerns gave the new plan their heartiest endorsement.

The plan is to be tried in Greater New York and New Jersey and may be extended to other cities in the future.

Mr. Edison made the following statement in regard to the plan: "The combination of the Ward special delivery wagon, sold on easy payments and my storage battery, on the new rental plan starts a new era for the electric vehicle. I believe nothing can now be produced which will surpass the electric motor for economy, reliability and safety in delivery service."

SPECIAL FORD BUS BODY

A body of light weight, substantial construction, and one which furnishes ample room is now being put out by the Auburn Mfg. Co., of Auburn, Ind. The accompanying cut illustrates this body. It is built with drop windows which can be quickly closed against the storm or opened to the summer breezes. It has a carrying capacity for seven passengers



Hotel or Jitney Bus Type

besides the driver and an emergency seat for an additional passenger. It has an entrance door at the front end on right hand side and a center door at rear end for exit, and both doors can be very easily made to be under the control of the driver without moving from his seat. The seats are built lengthwise of the body. The size of the windows are "glass opening 20 x 22." The front is a two-section clear-vision, rain vision, full adjustable automobile windshield. This body would appear to be suited to the needs of many who are looking for something of the kind at a fair price.

CARRIAGE FACTORIES, LTD., CANADA, MAY BUILD CARS

Carriage Factories, Ltd., a Canadian concern representing a consolidation of the principal Canadian companies manufacturing carriages and sleighs, including the Canadian Carriage Co., Brockville; Munroe & McIntosh, of Alexandra; Tudhope Carriage Co., of Orillia, and the Heney Carriage and Harness Co., of Montreal, may enter the market with a light, moderate-priced car which will be ready for the trade next spring. This car will be produced at the Brockville plant.

The four companies comprised in this combination are understood to produce about 75 per cent. of the carriages, sleighs and light vehicles used in the Dominion of Canada. The company has an authorized capital of \$2,000,000 common stock; \$2,000,000 seven per cent. accumulative preferred stock, and \$1,000,000 first mortgage six per cent. bonds. There is now outstanding \$1,200,000 of preferred, \$1,200,000 of the common, and \$500,000 of the bonds. Directors of the company include J. P. Tudhope, W. F. Brock, of the Royal Bank of Canada; W. F. Heney, W. J. Sheppard, director of the Royal Bank of Canada; J. A. McKay, Hugo Munroe and T. J. Storey, president of the Atlas Motor Co., Brockville, Ont.

TO MAKE AUTO BODIES

The Ninevah Coach & Car Co., Ninevah, N. Y., has increased its capital stock and will erect additional buildings for the manufacture of automobile bodies. New equipment will also be installed.

SEPTEMBER MEETING OF PHILADELPHIA CARRIAGE BUILDERS

The regular monthly meeting of the Carriage and Wagon Builders' Association of Philadelphia, was held at the Hotel Hanover, Twelfth and Arch streets, on Friday evening, September 17. This was the first meeting after the regular summer recess.

After the regular business, Ralph J. Brodsky, Ph.D., spoke on the subject of the new workmen's compensation law, which goes into effect in Pennsylvania on the first of January, 1916. Mr. Brodsky is an insurance expert, who has made a deep study of workmen's compensation, both in Europe and the different states of this country, and is interested in the Pennsylvania Manufacturers' Association's system of mutual compensation insurance.

Mr. Brodsky's address was listened to with the greatest attention, and many questions were put to the speaker. A committee was appointed to go further into the details of the mutual plan and report at the October meeting. The committee consists of Messrs. Marbaker, Keachline and Dunbar. As this committee's report will be important to every member of the association, it is desired to have an unusually large attendance on Friday evening, October 15.

Editor Cardwell announced the opening of the fall term of the vehicle drafting school, conducted under the auspices of the association, at the Y. M. C. A. central branch, and requested the members present to urge their apprentices and other workmen to attend the sessions.

It was announced that at the October meeting, which will take place on the evening of the 15th, a representative of The Pantasote Company would be present to address the members on the subject of Vehisote, a product of the Pantasote Co.

At the conclusion of the business meeting the usual dinner was served in the new dining room of the hotel.

MEETING OF ST. LOUIS ASSOCIATION

The Implement, Vehicle and Hardware Association of St. Louis held its first fall meeting Monday evening, September 13, in Parlor A, Hotel Planters. The banquet was followed by an interesting program, which had been prepared by the executive committee of the association.

Among the invited guests was Hon. Frederick D. Gardner, president of the St. Louis Coffin Co. (brother of Russell E. Gardner), who addressed the meeting on the subject of "Land Banks." Mr. Gardner is a member of the Governor's staff of Missouri and recently addressed a session of the State Senate and House on the topic of farm loans. He has been untiring in his efforts to secure the enactment of legislation which will permit the farmer to borrow money on his land at a reasonable rate of interest. Mr. Gardner's reputation as a speaker and the importance of his subject brought out a full attendance at the September meeting.

STUDEBAKER PLANT EXPANSION

The Studebaker Corporation has acquired a large property which adjoins its plant No. 3, and will begin at once the erection of additions to that plant. Other additions to be put up in Detroit, Mich., consist of a three-story extension to plant No. 5, a new drop forge shop, 62 x 264 feet, and an addition 62 x 140 feet to the blacksmithing shop, both of steel, glass and tile, to building No. 25. The old De Luxe plant, which is part of plant No. 3, will be torn down and a four-story building 52 x 326 will be erected to be used for machining work. An extension, 35 x 120 feet, will be made to the power house and the freight shipping platforms of plant No. 3 will be rearranged and extended.

These additions to plant No. 3 will probably be followed by others to other local Studebaker plants. Originally the cor-

poration planned to make 60,000 cars for the season 1916, but according to Vice-president L. J. Ollier, 75,000 cars have been contracted for.

PROPAGANDA TO PROMOTE THE USE OF WOOD FOR BODIES

"How can we induce motor car manufacturers to return to the use of wood for bodies?" was the principal topic of discussion at a special meeting of the Northern Hemlock and Hardwood Manufacturers' Association, held in Milwaukee, September 16 and 17. The meeting was called to discuss ways and means for stimulating the lumber trade, which has been in a state of lethargy for many months and shows a need for stimulation. It was decided to make a canvass of all makers of bodies and vehicles who have adopted sheet metal and aluminum for body making, with a view to resuming the use of wood.

The propaganda contemplates a carefully detailed campaign which is to bear fruit in 1917 and succeeding years. It will be principally an educational campaign, but the lumbermen will use direct means of forcing the issue by gathering their cohorts into an army that will refuse to purchase cars unless the bodies are of wood construction.

H. E. Christiansen, a well known hardwood lumber dealer of Milwaukee, who is taking a leading part in the movement, says: "It is a fact that in 1910 and 1911 one motor car builder alone was using lumber at the rate of 20,000,000 feet a year. In 1915 the same manufacturer is using only 2,000,000 feet. The profit is at least \$2 per thousand, so we can see that \$36,000 has been lost to the lumber trade in one instance alone."

Every lumberman who purchases a car in the future is to make a particularly strong effort to have his machine equipped with a wood body, according to the plans of the hardwood manufacturers. It is admitted that such procedure will be sufficient for 1916, but by 1917 the propaganda is expected to have made sufficient headway to count.

\$1,000,000 STOCK PROPOSED FOR HAYES WHEEL COMPANY

The officers of the Hayes Wheel Co., Jackson, Mich., will submit to the stockholders of the company a proposition tending to increase the capital stock from \$300,000 to \$1,000,000. A stock dividend of 166 per cent., or \$500,000, is to be declared and the balance, or \$200,000 in stock, is to be given to the owners of the property of the Pioneer Shaft & Pole Co., Anderson, Ind., which the Hayes company has just purchased. This newly acquired plant will supply timber for the manufacture of wheels. The local concern's business has been growing to such an extent that some time ago a plant was started in St. Johns, Mich., where truck wheels only will be made. Still further extensions are contemplated.

CARRIAGE HARDWARE CONCERN ADDS AUTO ACCESSORIES

It is announced that the Griswold-Sohl Co., for more than a half century in the wholesale carriage and heavy hardware business in Columbus, O., has purchased the entire stock of automobile accessories, together with the business of Harry E. Smith, 43 West Broad street, who is retiring on account of ill health. It is planned to remove the entire stock of automobile accessories November 1 to the Griswold-Sohl Co.'s building at 79-81 North Front street.

PERSONAL

R. C. Sykes has been promoted from the position of advertising manager of the Troy Wagon Works Co., Troy, O., to the position of sales manager, succeeding W. F. Jolley, resigned.

CONCERNING WAGONS

There seems to be but one reasonable conclusion in regard to wagon building, and that is that it will increase in activity. Factories are fairly busy, some are rushed. The greater demand comes from farmers.

Large areas are being reduced to cultivation, farm products are advancing in value, a heavy export demand in certain lines is the underlying cause, a demand which will presumably increase with the continuance of the war.

The European demand for horses has put much money in circulation, stock raising has been encouraged. So far, users of wagons have been conservative; they are having everything on wheels repaired, postponing expenditures for new wagons as long as possible; with all that, wagon makers are turning out more work.

Large crops promise more business in wagons, purchasing of wagon material indicates improving conditions; the strongest conservative lever is the possibility of an unexpected termination of the war which, despite evident improbabilities, holds many people back.

Before the war our farmers were pretty well fixed as to wagons, and a wagon with care and repairs lasts a long time. Farmers as a class do not discount the future to any extent; they wait until the repair man has about exhausted his resources; they want to see a little farther ahead.

The plow is the pioneer, the wagon follows it. The trans-continental railroads have created farming possibilities for more than one coming generation; the present is the time for thinking and planning, especially as to the war outcome; the farmer wants to see a probable market before he sets his plow to work.

No matter from what angle we view the future we see a new wagon, a buggy means leisure, a wagon means work, an automobile expresses exultation.

We are now creating a reservoir of energy and awaiting developments.

It will be up to the shipyards to meet the ocean transportation problem. It is up to the ammunition factories to say how long the war will last, helped, probably, by the devastation of disease.—Canadian Implement and Vehicle Trade.

UHLENHAUT WAGON CO. REPORTS BETTER BUSINESS

Better business than this time last year is reported by the Uhlenhaut Bros.' Wagon Co., automobile bodies and business wagon manufacturers, and according to an official of the company, indications are for big business in the future. The firm, which was organized in 1889 as a co-partnership and incorporated in 1906, does repairing, painting and trimming of automobiles and wagons as well as makes patent milk cabinets. At the time of incorporation, W. A. F. Uhlenhaut was elected president. Mr. Uhlenhaut, who has conducted the business since its establishment, also is manager.

The Uhlenhaut Co. was awarded a premium for designing and building a wagon for a prominent local tea and coffee concern the World's Fair year. Several years ago the company built the largest bottle beer wagon then in St. Louis for a large brewery.

BUGGY COMPANY MAKES TRAILERS

The Page Bros. Buggy Co., Marshall, Mich., an old established concern which has been making buggies and carriages for many years, is now also making trailers which will be known as the Page auto trailers. The trailers are made in four models. Models A and B have 750 lbs. capacity, but while the former has 1½ x 5/16 in. round edge steel tires and costs \$40, the other model is equipped with 1½ in. solid tires, the price of this model being \$50. Both have the same kind of body, 38 x 82 in., with 7 in. sideboards and 4½ in. flareboards. Sheldon axles and springs are used. Both models C and D are

listed at \$75 and have 1,250 lbs. capacity, 1¾ in. solid rubber tires, artillery wheels. The former model has 7 in. straight sides, but model D has 11 in. straight sides.

STUDEBAKER SCHOOL FOR EMPLOYEES

Three-Year Commercial, Mechanical and Technical Courses with Savings

The Studebaker Corporation, of South Bend, Ind., has made announcement of the establishment of a training school for the purpose of assisting the young men employes of the corporation to avail themselves of an opportunity of taking a commercial, technical or mechanical course.

The conditions as set forth in the announcement, are as follows: Regular students must be under 17 years of age for the preparatory office course and under 20 for the apprentice training course. They must be physically sound and of good moral character. The course will be carried on for three years and will not interfere with the regular work of the student. The student will contribute 50 cents a week of his wages as a guarantee of good faith in continuing in one of the courses until same is finished, which sum will be forfeited to the corporation in case the student should be dismissed for incompetency, irregularity, or any reason other than sickness, or leaves of his own free will. This weekly contribution will be deposited in a savings bank to the credit of the student, the total sum with interest to be returned to the student when he has satisfactorily completed his course.

The corporation will, in recognition of this effort for self-development, pay the student's membership in the Y. M. C. A., and arrange for the course under the supervision of the Y. M. C. A. and pay all expenses. In addition to the foregoing a bonus of \$100, \$50 and \$25 for each student completing the course with an average percentage of 95, 90 and 85, respectively will be given.

DECISION IN WELLCOME AMBULANCE COMPETITION DELAYED

The Ambulance Construction Commission of the Wellcome Bureau of Scientific Research, London, England, which last spring announced the offer of a large money prize for the best ambulance design, has sent the following notice to competitors: "10 Henrietta Street, London, W.

"Owing to the large number of designs received, and the jury's intention to submit certain among them to a practical test, the final decision will in all probability be considerably delayed. No correspondence on this matter can be considered, but every effort will be made to bring the competition to a conclusion within a reasonable time."

STERLING MOTOR TRUCK CO. BUILDS

The Sterling Motor Truck Co., Forty-sixth avenue and Rogers street, West Allis, Milwaukee, Wis., is building a large factory addition. The concern formerly was known as the Sternberg Motor Truck Co. It has been doing a large foreign business, and these demands, together with the unusually large business now being received from domestic sources, has made it necessary to nearly double the size of the works. The plant was erected only four years ago and was then expected to have a capacity for at least ten years.

NEW MOTOR COMPANY AT TOLEDO

Papers of incorporation have been granted the Universal Motor Co., of Toledo. The new concern has a capitalization of \$100,000. The incorporators are Howard Lewis, Harold J. Keho, Frank S. Lewis, all of the law firm of Doyle, Lewis & Lewis; H. Emery, Paul W. Alexander and Frederick Gaines.

Trade News From Near and Far

BUSINESS CHANGES

Andrew Langston has purchased the vehicle establishment of T. H. Lux, at Randolph, Neb.

Frank Sutton succeeds Ed Morgan in the vehicle and implement business at Dublin, Ind.

Paris & Royster, vehicle and implement dealers at Wanette, Okla., have sold out to A. Cole.

J. B. Cowart succeeds the J. W. Murray Hardware Co., at Mineola, Tex. Vehicles are handled.

The vehicle and implement business of J. V. Pryor at Spencer, Ind., has been purchased by Vandeventer & Hicks.

J. S. Morris Carriage Mfg. Co., Waupun, Wis., has dissolved. J. S. Morris will continue as J. S. Morris, carriage manufacturer.

H. G. Schaefer & Son have taken over the farm implement and vehicle business which has been conducted for several years by John Rohner, Sheffield, Ia.

George N. Thompson, of Shelbyville, Ky., has bought out the interest of his partner in the firm of Taylor & Thompson, dealers in vehicles, harness and implements.

The Anchor Buggy Co., Cincinnati, O., has reduced its capital from \$400,000 to \$200,000, the step being taken because present conditions do not require so large a capital.

Elgie F. Meyers recently purchased the vehicle and harness business of L. E. Ager, at Peru, Ind. Mr. Ager will continue in the store for a short while to assist Mr. Myers.

Edward Wolverton has purchased the vehicle business that Charles and Andrew Kindler have been conducting at Huntington, Ind. known as the John Kindler Buggy Co.

E. S. Swaverly has purchased the interest of his partner, Mr. Lash, in the firm of Swaverly & Lash, at Kendallville, Ind., and will continue to handle all kinds of implements, buggies, etc.

N. E. Marcell & Co., who have been engaged in the implement and vehicle business at Santa Rosa, Cal., for a number of years, have purchased the business of A. Trembley & Co. at the same place.

E. G. Bridge, of Kenton, O., has purchased R. F. Harrod's interest in the retail vehicle and implement business of Harrod & Hover, at Belle Center, O. The firm will be known as Bridge & Hover.

Andrew Abrahamson, who for several years has been wagon maker in the salt city wagon shop at Manistee, Mich., has purchased William Martinson's interest in the establishment and is now the sole owner.

NEW FIRMS AND INCORPORATIONS

Thos. Dailey has opened an implement and vehicle store at Montgomery, Ind.

F. W. Albright will engage in the implement and vehicle business at Van Hook, N. D.

It is reported that F. A. Vandeventer will engage in the implement and vehicle business at Glasford, Ill.

It is reported that Albright & Rider will engage in the implement and vehicle business at Kaluga Station, P. O. Drake, N. D.

Thomas Daily has opened a hardware and implement store at 212 Busseron street, Vincennes, Ind., where he will handle a full line of vehicles.

The Brownsville Hardware Co. has been incorporated at Brownsville, Tex., to conduct a wholesale and retail vehicle, implement and hardware business.

The Cruse-Crawford Mfg. Co. will build a two-story brick, 75 x 100 foot building at Birmingham, Ala., to manufacture automobile tops, wagons and buggy bodies.

NEWS OF THE TRADE

The Willys-Overland Co., Toledo, O., will add one story to a steel building and a 60-ft. extension to another factory.

The Premier Motor Mfg. Co., Indianapolis, Ind., may locate a plant in Louisville, according to advice received by the local commercial club.

The Grant Motor Co., of Findlay, O., is staking out the foundations for the erection of three new buildings. The company is employing 250 men.

The plant of the Tayson Rubber Co., Wooster, O., has been purchased by the Kelly-Springfield Co., Akron, O., and will be used for the manufacture of automobile tires.

The Ajax-Grieb Rubber Co. Trenton, N. J., has plans for the erection of a three-story addition to its plant, 200 x 350 ft., provision being made for three stories to be added.

The Parrish & Bingham Co., Cleveland, makers of automobile frames and sheet metal stampings, has purchased a ten-acre site adjoining its new building and will erect an additional factory.

The T. T. Haydock Carriage Co., Cincinnati, contemplates manufacturing automobiles. If tentative plans are carried out a good number of machine tools and other equipment will be required.

The Cortland Cart & Carriage Co., Sidney, N. Y., increased its capitalization from \$75,000 to \$225,000 to take up the manufacture of automobiles. It expects to continue its carriage business as usual.

The Union Automobile Co., Auburn, Ind., has been incorporated with \$100,000 capital stock, to manufacture automobiles. The directors are C. M. Brown, John Zimmerman and W. H. Schaab. A plant has been leased.

The King Motor Car Co., Detroit, has purchased the four-story factory formerly occupied by Knell & Adams. It contains about 70,000 square feet of floor space and will enable the company to enlarge several departments.

C. H. Lambert, Louisville, former president of the Hercules Motor Car Co., New Albany, Ind., is reported to have plans for putting the company's factory in operation again. It lately has been turned over to the bondholders.

The Sterling Motor Truck Co., Forty-sixth avenue and Rogers street, West Allis, Milwaukee, has awarded contracts for a factory addition which will practically double its capacity. Klug & Smith, consulting engineers, Milwaukee, are in charge.

The Hayes Truck Wheel Co., St. Johns, Mich., has been incorporated with \$100,000 capital stock, to manufacture wheels for automobile trucks. A factory has been secured and is being remodeled. C. B. Hayes, Jackson, Mich., is head of the company.

Finnesey & Kobler, manufacturers of wagons, etc., Phila-

delphia, have awarded contract for the construction of a two-story brick addition, 36 x 180 feet, to be erected at Twenty-sixth street south of Parrish street, at an estimated cost of \$11 500.

Arthur Todd, of Richmond, Ky., is erecting a handsome new two-story brick building at the corner of Second and Water streets, to house his carriage business. This building, when completed, will be one of the handsomest vehicle stores in central Kentucky.

The Timken Detroit Axle Co., Detroit, Mich., is adding a one-story steel and reinforced concrete drop forge plant, 70 x 400 ft., to cost about \$260,000. It will be equipped with boilers of 1,200 h.p. capacity, magnetic overhead cranes. Thirty-five drop forging machines are specified.

Large extensions will be made to the rubber tire industry in Akron, O. The Goodrich Rubber Co. has begun the erection of a five-story building 270 x 800 ft., and will also erect a six-story building. The Goodyear Tire & Rubber Co. will build an eight-story building 80 x 100 feet. The General Rubber Mfg. Co., Akron, has been incorporated with a capital stock of \$200,000 by M. O'Neil, and others, to manufacture rubber tires and accessories.

TRI-STATE CONVENTION FEATURES

Among the features of the Tri-state Vehicle and Implement Dealers' Association convention, to be held in Cincinnati, O., the last week in October, will be a joint discussion between vehicle manufacturers and implement manufacturers and jobbers on "The Future of the Trade." Ed. S. Ralph, of Springfield, O., and P. C. Kirtley will represent the implement manufacturers and jobbers, and the vehicle end will be upheld by C. T. Egolf and W. E. Brunsman, of Cincinnati. This discussion will be started at the first session in the afternoon of October 26 and be completed during the second session the following afternoon.

Other features of the convention will be an address by J. A. Craig, of Janesville, Wis., on "What Has Been Accomplished Through Organization for Both Manufacturer and Dealer," and an address by Dr. W. E. Taylor, of the soil culture department of Deere & Co., on "Relation of the Dealer to the Farmer." Another important address will be that of C. E. Merkel, whose subject is: "Why I Believe In and Belong to a Local Club."

An exhibition of implements and vehicles will be held as usual under the direction of the association. This will be housed in Music Hall, which affords ample space for a large display. The Tri-state show was established many years ago. It was the first of the indoor exhibitions in this line and it has been one of the most successful. The entry list assures a representative display of horse-drawn vehicles and farm operating equipment.

FAVOR TARIFF COMMISSION

Following the organization of the Tariff Commission League in Chicago recently, and exploitation of the plan and policy to stir public interest and secure legislation that will make for a permanent nonpartisan tariff commission, there has been the liveliest interest manifested in all parts of the country. From the headquarters of the league in Chicago a news bulletin has just been issued containing the statement that of more than 400 commercial, labor and agricultural organizations and daily newspapers heard from directly, representing every section and political complexion, there were only 14 disapprovals of the plan, a half dozen organizations that could not give any expression, and another half dozen held their expression in abeyance until the subject was further digested.

The plan of the Tariff Commission League contemplates the general approval and support of the bill to be submitted to Congress for the establishment and permanent maintenance of a nonpartisan commission (the tentative bill prepared by the

league contains the significant provision that "No one political party shall have a majority of the members of the commission"), which shall have broad powers, not only advisory, but initiative, in seeking all data, holding hearings wherever deemed advisable, sitting with the tariff bodies of both branches of Congress, the commission being seven in number, with an extended tenure of office and remuneration on the same basis as a cabinet official, and with automatic annual appropriation sufficient to cover all essential cost of learning and determining the actual economic tariff facts.

WAR'S TEST ON SPRING CONSTRUCTION

The July issue of the *Automobil-Rundschau*, of Berlin, notes the following regarding spring construction:

It was soon proved that the wagons of each and every firm have a special weakness. The commonest effect of the Russian roads were spring fractures. Practically none but front springs were broken, however, and these only in two characteristic places, namely, close to the front pivot exactly at the end of the first leaf adjacent to the single or double main leaf and, secondly, a few centimeters in front of the clip—rarely at the hole between the clips. Notably few fractures occurred in Daimler springs, which appear to be ground with unusual care. It happened that the spring forging at the front end of the frame was forced deeply into the road when a fracture took place.

The manner of securing spring pivots and shackles to the frame was not always found substantial. In the case of one firm, the lug carrying the rear spring shackle came loose regularly. It was joined to the lower frame flange by six rivets, and the rivet heads came off.

FORD PASSES THE MILLION MARK

On October 1 the Ford Motor Co., since the first car was completed June 15, 1903, had manufactured and sold precisely 1,006,835 cars. This total is the joint output of the Ford Motor Co.'s factories in Detroit, Walkerville, and Manchester, Eng., and the 25 Ford assembly plants in this country. Besides these 25 assembly plants there are 24 Ford sales and service branches in the United States. The Ford factory and Detroit assembly and sales branches together now employ about 30,000 men.

HAYNES TO ERECT ADDITIONS

Additions to the plant of the Haynes Automobile Co., Kokomo, Ind., will cost \$250 000. A large office building is now being completed and will stand outside the old plant, the offices of which will be made a part of the space given over to the manufacture. In addition there will be erected at once three new steel and concrete structures alongside of the present factory. There will be new painting, testing, power plants and also a new building for the storage of rough and finished materials and cars.

REFUSED WAR CONTRACT

According to a local paper the Kentucky Wagon Mfg. Co., of Louisville, Ky., has refused contracts for \$26,000,000 worth of military rifles, supposed to be wanted by the Russian government. R. V. Board, president, recently returned from New York, where he is said to have met representatives of those seeking to place the orders. Lack of equipment and the pressure of other demands on the plant of the local concern is said to be responsible for the refusal of the contracts. It was proposed to allow two years' time for making the rifles.

D'ARCY SPRING CO. ADDS

The D'Arcy Spring Co., Kalamazoo, Mich., manufacturer of automobile springs, will erect an addition to its plant.

OBITUARY

Max M. Betz, 77, wagon manufacturer and active in fraternal and German societies of Philadelphia died September 23, at his home, 2814 North Broad street.

Isaac D. Blauvelt, 82, for many years a carriage builder in Paterson, N. J., died September 27, after a long illness. He was born in New Jersey and when 16 years of age entered a carriage shop at Little Falls, to learn his trade. Later he started in business for himself in Paterson. In 1860 he located at Market and Prince streets, and in 1865 removed to Paterson and Market streets. He was a member of the Board of Education and served a term as a State Assemblyman. He was a Mason and a member of the Swedenborgian Church.

Charles Eckhart, 74, old time carriage manufacturer and philanthropist, and at one time prohibition candidate for governor of Indiana, died at his home in Auburn, Ind., October 1, following a long illness. He was president of the Dekalb county board of charities and correction. His gifts to the city of Auburn aggregated \$150,000, including a \$40,000 public library, \$60,000 Y. M. C. A., a \$20,000 park and a \$1,000 fountain for Library park. Mr. Eckhart had been a carriage manufacturer, and his sons, who succeeded to the business, are now owners of the Auburn Automobile Co. He was born in Germantown, Pa. At the age of eight years he became a weaver in his father's mills. After a financial panic, which closed the mill, he walked 30 miles to find a job learning the carriage makers' trade. He finally purchased the shop. He sold his business to enlist in the civil war, and in Company A, 104th Pennsylvania volunteers, was in the peninsular campaign. To commemorate one of the battles he sent an artist to the place a year ago to paint "The Battle of Fair Oaks," the picture costing a small fortune. Eckhart was discharged on account of ill health after the battle at Hilton Head. After the war he went to Kendallville, Ind., and in 1874 established a small shop on the site of the now large Eckhart factory. Surviving him are three sons, Frank, Morris, and Will, and a daughter, Mrs. Anna Shugars.

George Hunter, 88, retired carriage manufacturer, died September 29, in Canal Winchester, O. Mr. Hunter lived in Columbus for a number of years.

Z. Taylor Rickards, a retired vehicle builder, died at his home, 1712 North Fifty-fifth street, Philadelphia, Tuesday, September 14. Mr. Rickards was a member of the firm of Rickards & McLaughlin, which formerly had offices in the Arcade Building, Philadelphia. Later the firm operated a factory in Trenton, N. J. He retired several years ago on account of illness, and has been an invalid since that time. He was the first president of the Carriage and Wagon Builders' Association of Philadelphia, and there was a large delegation of members from this organization at the funeral.

Joseph O. Schwartz, founder of the Joseph Schwartz Co. Ltd., 542 Baronne street, New Orleans, La., died at his home in that city on September 28. The Joseph Schwartz Co. is one of the most important concerns of its kind in the south. Mr. Schwartz was a member of the Carriage Builders' National Association.

VICTOR TOP CO. IN NEW PLANT

The Victor Buggy & Auto Top Co., formerly at 1545 North Broadway, St. Louis, Mo., is now installed in its new plant at 2215 Pestalozzi street and has doubled the capacity of its old plant.

The Deal Buggy Co., of Jonesville, Mich., has decided to discontinue business and has appointed the Detroit Trust Co. liquidating agent.

WANTS

Help and situation wanted advertisements, 1 cent a word; all other advertisements in this department, 5 cents a word; initials and figures count as words. Minimum price, 30 cents for each advertisement.

PATENTS

Patents—H. W. T. Jenner, patent attorney and mechanical expert, 606 F St., Washington, D. C. Established 1883. I make a free examination and report if a patent can be had and exactly what it will cost. Send for circular.

MERRILL SPRING TO ADD

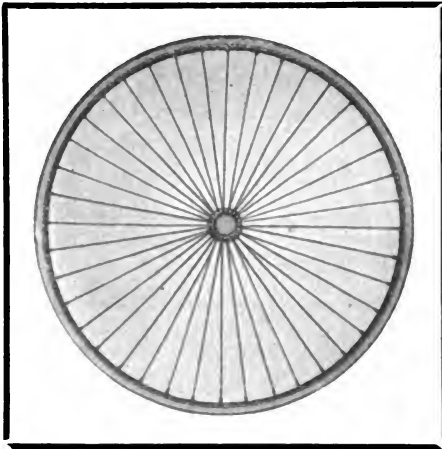
The E. R. Merrill Spring Co., 526 West Twenty-eighth street, New York City, manufacturer of automobile and truck springs, is having plans prepared for alterations to two buildings and the erection of two other buildings.

IN RECEIVER'S HANDS

The business of the S. G. Gay Co., Ottawa, Ill., manufacturer of vehicles, has been placed in the hands of a receiver, the court appointing F. A. Hathaway. The company's assets are placed at approximately \$165,000 and its liabilities at \$75,000.

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Reports from all parts of the country indicate that next season will see more Mott Wire Carriage Wheels used than ever before. In these days of severe competition, there must be some good reasons why the demand for Mott Wire Wheels is steadily increasing. Here are a few indisputable sales features:

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4. The wire spokes act largely as extra springs and produce comfortable, easy riding on all roads.
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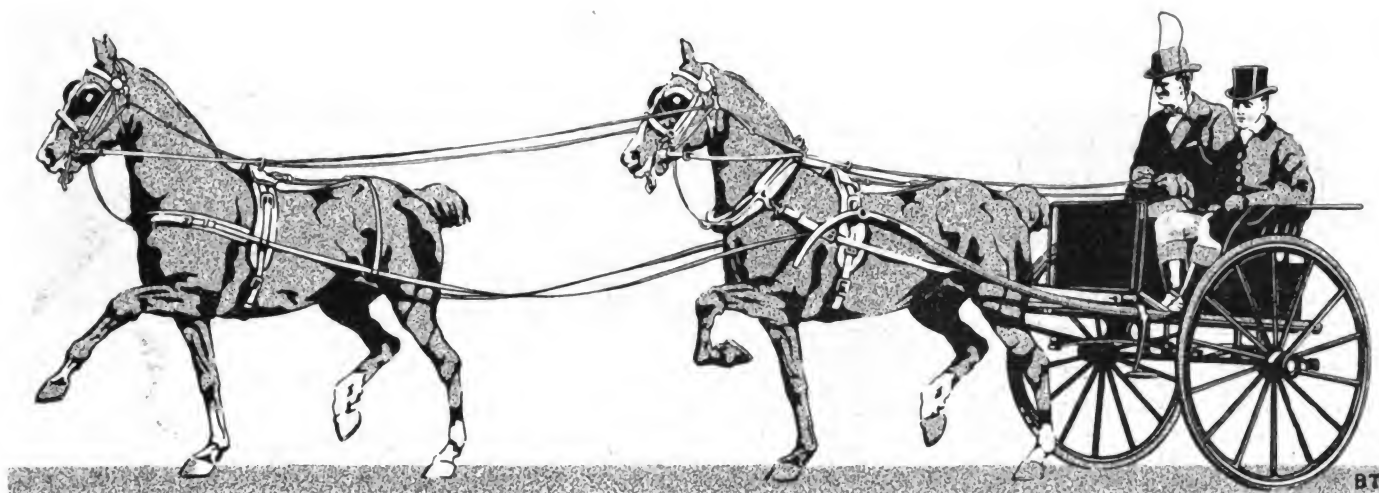


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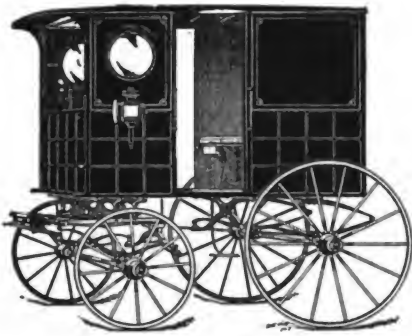
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A Few Words About the North Patented Bolt:

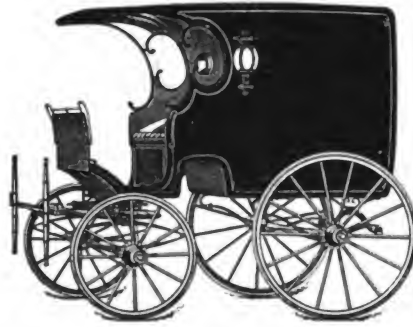
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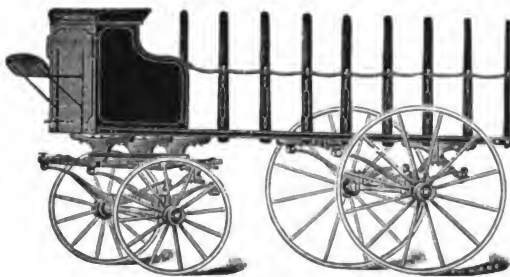
No. 112.—Milk Wagon.



No. 111.—Altman Wagon.



No. 113.—Grocery Wagon.



No. 122.—Flour Truck.

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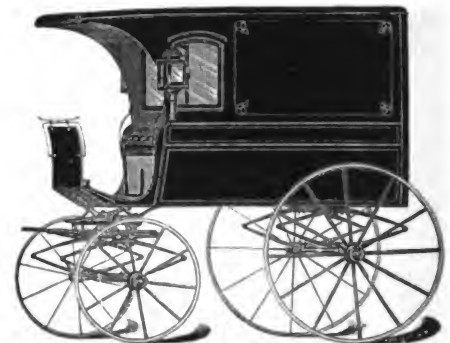
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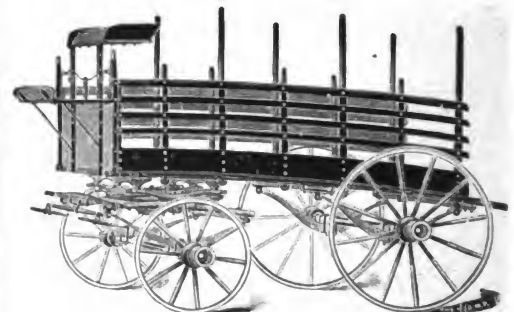
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No. 115.—Delivery Wagon.



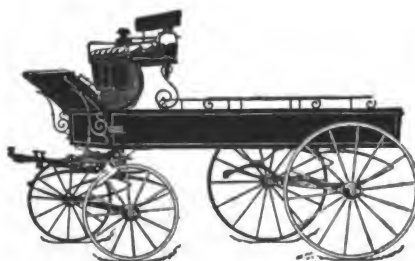
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The **RETAIL HARNESS MAKERS** of the United States and Canada comprise the principal part of the Directory, arranged by State, Town and County, and in the large cities, the street and number is given. Those rating (approximately) over \$1,000 are marked.

A list of **HARNESS DEALERS** as distinguished from retail harness manufacturers, is also given. The value of this list to those who solicit the vehicle, implement, hardware and department stores will be readily appreciated.

A list is also published of Export Commission Merchants, giving the class of merchandise they handle.

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PUBLISHERS OF "HARNESS"

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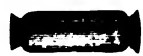
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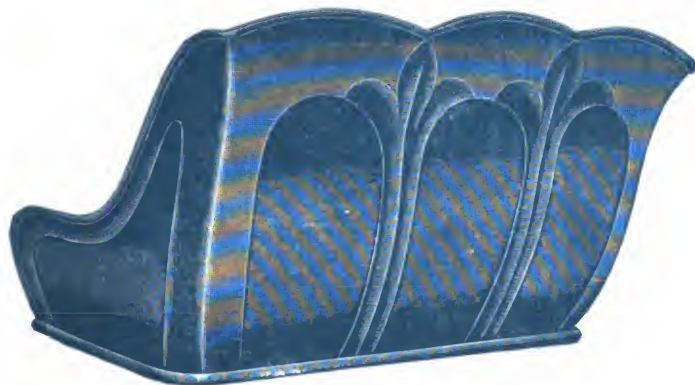
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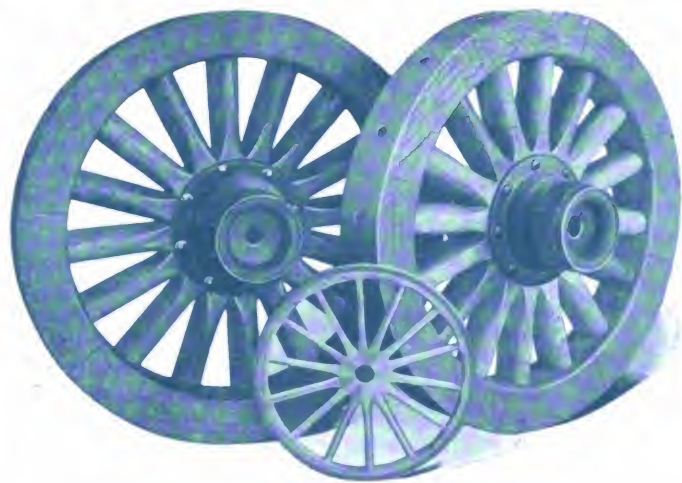
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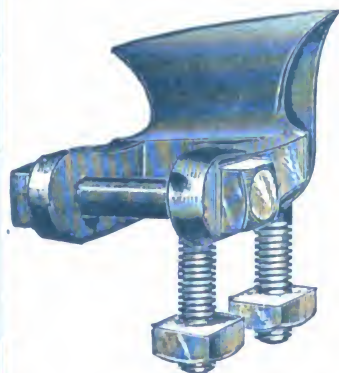


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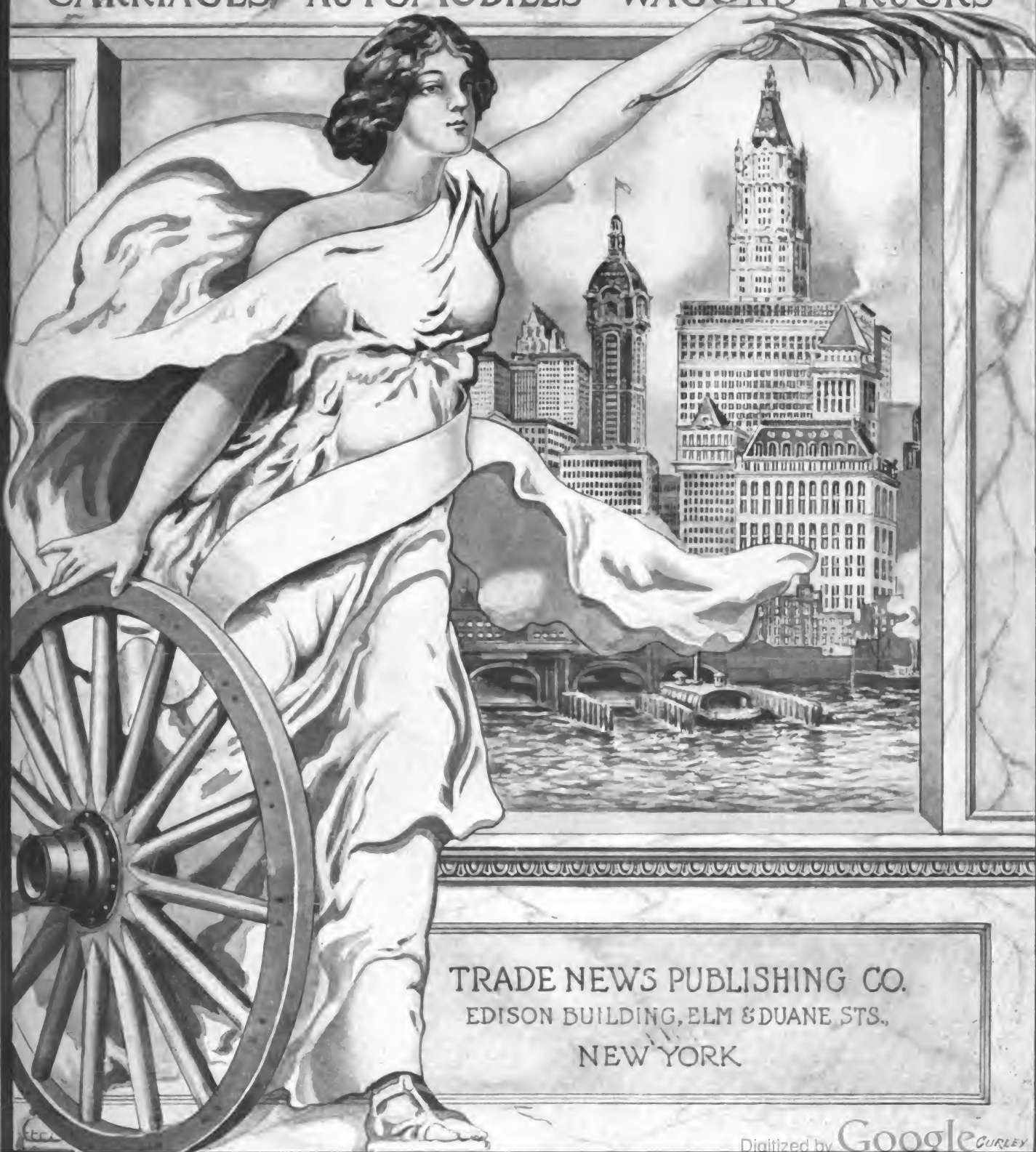
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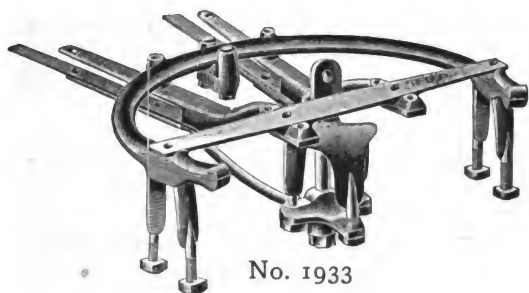
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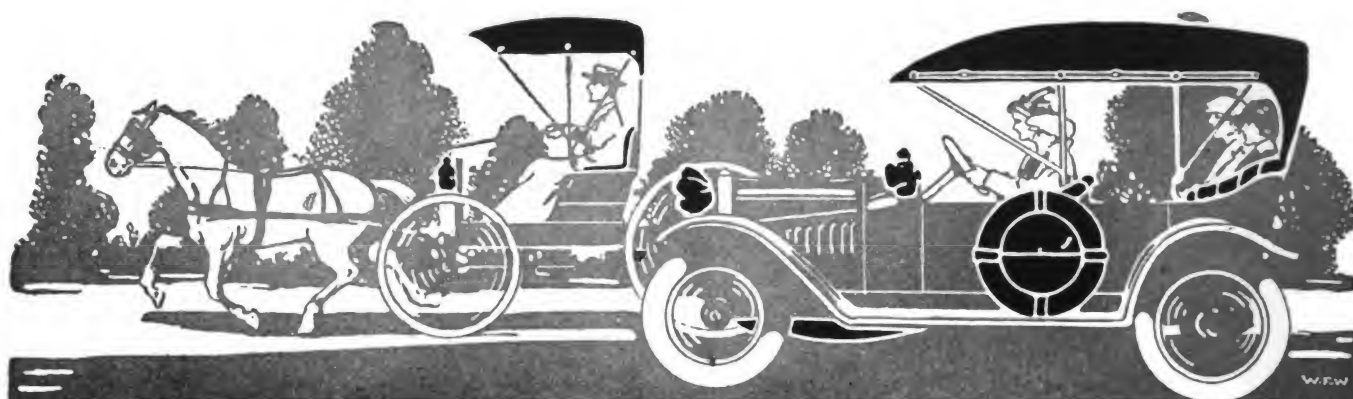
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Vol. LVII

NOVEMBER, 1915

No. 8

THE TRADE NEWS PUBLISHING CO. OF N. Y.

Publishers of THE HUB

J. H. WRIGHT, *President*

G. A. TANNER, *Secretary and Treasurer*

EDISON BUILDING, COR. ELM AND DUANE STS., NEW YORK

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Federal Trade Commission

The Federal Trade Commission is making a study of combination in export business and of other conditions which may affect American foreign trade. It will soon send out 30,000 letters of inquiry, as a part of the investigation of conditions that affect our foreign trade. About 20,000 letters will go to American manufacturers and producers, and about 10,000 will be sent to other authorities on foreign trade conditions, such as export commission merchants, manufacturer's export agents, importers, lawyers, economists, bankers, engineers, etc. Through this letter of inquiry the commission particularly desires to get the facts from many different points of view and from all sides of controverted questions. The 20,000 names of manufacturers and producers include every important branch of American industrial enterprise and represent every shade of opinion in regard to the present problems of our foreign trade. The list takes in big business and little business; companies that are old in exporting and firms that are new; concerns whose for-

ign trade is limited to South America or Europe and those whose products are sold all over the globe.

The commission desires full and frank statements in reply, and the inquiries have been drafted with this purpose in view. Any portions of replies that are designated will be held confidential.

It is expected that the work of the commission, when completed, will place in the hands of American business interests a comprehensive and exhaustive study of the problems encountered in successfully conducting export enterprises.

Better Business Conditions

The outstanding feature of the business situation in October has been the fact that all trade has been unmistakably better. Every part of the country sends good reports, and the contrast they make with the conditions of a year ago is calculated to inspire the most profound sentiments of relief, satisfaction and gratitude.

The south, which a year ago was prostrate, with cotton selling at seven cents per pound or less, has regained its footing and its courage. Although this year's cotton crop is smaller by possibly more than 25 per cent., the total value will be higher than last year's, and it has been raised at a considerably lower cost. Furthermore, the south has grown more of other crops, particularly corn and wheat, than ever before, and has reached the stage of giving thanks for the lessons of adversity. With the rise of cotton to twelve cents per pound, a different atmosphere pervades the south, and it is again an active factor in the trade of the country.

The grain farmers are not faring quite so well as last year, for prices are lower, but the yields are so large that they have little cause for complaint. The fruit and root crops are generally good. The wet season drenched even the plains states, so that the "dry" farmers have had a prosperous season, with unheard of yields of wheat, as well as abundant crops of sugar beets and the grasses. The prospect for a continuance of the duty on sugar increases the cheerfulness of the west. The wool growers have sold this year's clip at record prices, and the live stock interests are exceptionally prosperous.

There is enormous activity in the production of copper, lead and zinc; it is now up to capacity of the mines and smelters, and in the case of zinc the smelter capacity is being materially increased. So far as agriculture, stock raising and mining go the west is exceedingly prosperous.

The iron and steel industry has expanded steadily and rapidly in the past six months, until the production of

basic materials is now surpassing all records, although some lines of finished goods are not in normal demand. There is a broad general improvement, the point has been reached where the fear of not being able to get deliveries is stimulating purchases, and prices are advancing in many lines to the best figure realized in recent years.

Current railway earnings and bank clearings are now comparing with the subnormal figures of a year ago, and show heavy gains, for traffic and trade a year ago were about as poor as could be. Allowance must be made for extraordinary activity in certain lines, notably automobiles and war materials, but the general merchandise movement is much freer, and more confidence is manifested in commercial and industrial circles than at any time since the outbreak of the war. The figures for idle cars have taken a sudden drop, and complaints of car shortage, congestion of traffic and of labor shortage are becoming frequent. Business is not booming in all lines. Large construction work is still below what it should be in normal times in this growing country, but the amount of buildings of the smaller class makes a good showing. The available supply of labor is so fully employed that the situation is on the verge of being critical. Food supplies promise to be abundant and moderate in price for the coming year, and the outlook for general comfort and prosperity in the United States is at present very promising.

The United States manufactured 703,527 motor cars last year, or 36 per cent. more than it made during the previous year. The value of these cars was \$523,463,803.

During the ten years which ended with 1910, 5,250,000 immigrants came to this country and remained here. In the same period 3,250,000 returned to their native countries.

The wealth of the world grows at the rate of \$15,000,000,000 a year.

BUSY WAGON MAKERS HELP LUMBER TRADE

As an indication of the activity and trend of the carriage and wagon building industry, it is interesting to note a recent report of C. F. Carpenter, appearing in the Chicago Herald for November 9. Mr. Carpenter says:

Inquiries for oak and hickory vehicle and implement stock were numerous in the Chicago lumber market yesterday. Specifications received from one southern Illinois manufacturing concern request quotations on approximately 850,000 feet of the species mentioned for use in the manufacture of farm wagons.

Local lumbermen who specialize in carriage, wagon and agricultural implement stocks, say this is one of the largest single inquiries for wagon stock received in this market for several months. The inquiry is for stock for axles, hubs, bolsters, reaches, tongues, and in fact all items required in the manufacture of 5,000 first class, and 3,500 second class wagons.

It also was reported that wheel factories in all sections of the country are busy and in consequence there is now good demand for hickory rim strips, spokes and hubs from this particular branch of the industry. In consequence of the improved conditions in the vehicle industry increased demand is reported for gum boards for use in the manufacture of wagon boxes.

Several inquiries were received from plow factories for hickory beams, also indicating increased activity in that industry.

J. S. Houston & Co., wholesalers of wagon and carriage wood stock, reported steady improvement in the industry during the last month. Inquiries and orders are more numerous, notwithstanding the fact many of the factories are now engaged in taking inventories. It is said many manufacturers allowed their stocks to run low, and in consequence indications are favorable for a good buying season to develop during the winter months.

HOW THE BUGGY WAS SOLD

A writer in a recent issue of Implement-Hardware Bulletin tells a mighty good story about a dealer who was endeavoring to sell a customer a buggy for cash. The customer had the money, and wanted it to go as far as he could—and he was undecided whether he would or wouldn't buy a car.

At all events he was up against the fact that mail order concerns quoted thus and so. His mail was crowded with offers to supply wonderful buggies at unheard of prices. Regardless of comparative qualities and easy buying conditions the quoted prices appealed to him. He forgot the buying conditions. This is how the dealer argued the point with his customer:

"The advertisement says 'cash on delivery,' and, as you have the money, terms cut no figure and you are justly entitled to the most your money will buy," says the dealer. "Now, here's the point, Andy: This is my business and I've got sense enough to know that I must meet competition and meet it fairly or go out of trade. So I'm doing exactly the thing you want to do and which John's boy did—I'm buying these buggies for cash—spot cash—and I'm using my knowledge of the buggy business to get the very best value for my money. All the frills, fancy terms and long time inducements are cut out and I own this vehicle stock right.

"I expect to sell a great many of these buggies and consequently can handle them on a very close margin, and I am able to offer you a rig, fully equal in quality and appearance to anything you can find anywhere, at a little less price than you can get anywhere and with the added privilege that you can examine it before you buy and can come back to us if anything goes wrong. I am not asking you to buy this, Andy, from any foolish sentimental reasons, or to help out on any 'buy-your-goods-at-home' campaign, but because the buggy is worth the money and I am giving you exactly what you want for the money you've got to spend. Will I give you a whip? Yes, certainly. I never sent a buggy out in my life without a new whip in the socket."

THE BUGGY BUSINESS

Reports from manufacturers and dealers respecting the present demand for buggies and the prospects for future business vary quite a little according to the localities from which we receive them. In some western states reports are of a very cheering character, not only as regards the amount of business already transacted, but also in reference to the immediate outlook. A great many dealers state that their business has far exceeded their expectations, and that numbers of second orders have been necessitated by the clearing up of their first lots. In other cases dealers tell us that their trade so far this year has been about normal—no variation being noticeable, one way or the other.

Other reports are somewhat less favorable and seem to reflect a want of confidence in the outlook based on some unaccountable foreboding on the dealers' part that industries of all kinds are, to use a somewhat unclassical expression, "on the blink."

As a matter of fact, there are undoubted signs of a considerable improvement in the business, and the preponderance of favorable reports over those of the opposite character is easily five to one.



JUMBO BUGGY

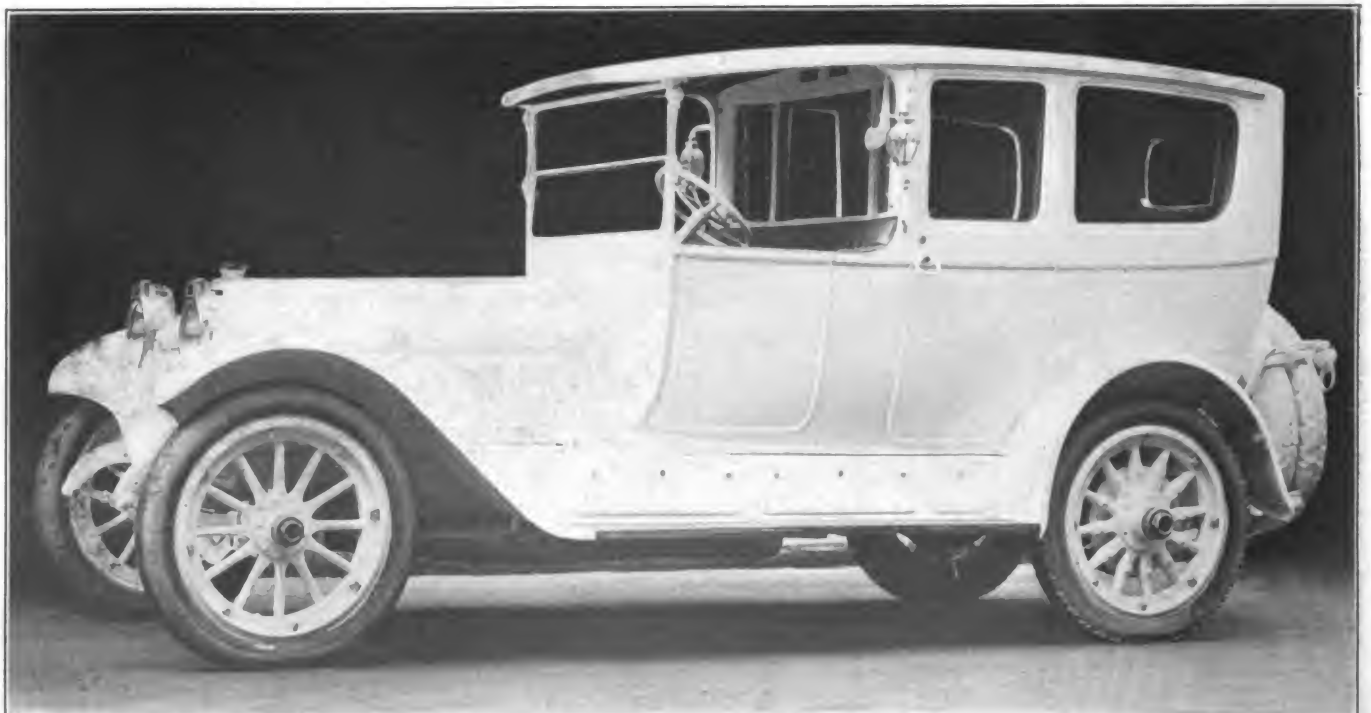
With extra wide body and large roomy phaeton seat

Manufactured by Sayers & Scovill Co., Cincinnati, O.



INTERIOR OF \$10,000 LIMOUSINE

Upholstered in genuine pigskin; roof of slatted, polished mahogany
Designed and built by Locomobile Co. of America



\$10,000 LIMOUSINE

Special white enamel finish, designed and built by Locomobile Co. of America for a Havana millionaire

ULTRA LUXURY IN BODY DESIGN

An interesting and distinguished motor car was recently shipped to Senor Pelayo, the well known millionaire of Havana, Cuba. The car is a "38" seven-passenger Locomobile limousine, the exterior of which has been enameled a pure white. This porcelain effect was obtained through the use of a special imported enamel containing no varnish, thereby eliminating the yellowish cast which appears in many white cars. Two very fine stripes around the edge of the panels in light green, furnish the only touch of color on the car.

The entire interior, including the driver's compartment, is upholstered in genuine pigskin. On account of its thickness this material is difficult to handle and on this order it was necessary to use 24 skins, selected and assorted from 60 submitted for the purpose.

Another feature of the finish of the car is the roof, which is constructed of jointed slats of selected and polished mahogany. The central idea back of this novel scheme of finishing the car in white enamel, pigskin and mahogany was to afford an impression of coolness.

This body design, finish and equipment, is an example of possibilities obtainable when one has the money to "pay the piper."

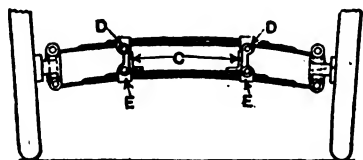
NOVELTY IN LIGHT CAR DESIGN

An Attractive Machine Designed by a Well Known Inventor

Among a number of recently published patent specifications in England there has come to light a very interesting design for a light car by Dr. Low. Apart from the engine and steering mechanism there is novelty in almost every detail.

As will be gathered from the drawings, the external appearance of the car is taking. It is of stream-line form and flush-sided throughout, with a minimum of corners and angles.

In plan the main frame members are curved to correspond to the shape of the body sides, and attached to these at various points are a number of ribs, A, which resemble very much the



View of the front suspension of the Low cycle car

ribs of a row boat in that they are U-shaped and extend underneath the frame and up both sides. The body panels are attached to these ribs and extended round and completely underneath the car, so that the body, undershield, and frame are all integral with one another, which completes the resemblance to boat construction. It will be noticed that the paneling is extended behind the back axle, and that just above the axle is a locker space, B. The seat, apparently, is of the hammock type.

Transverse Front Springing

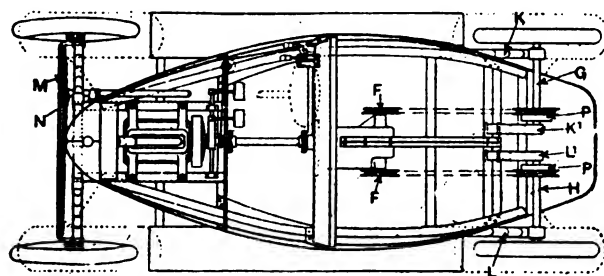
The engine is carried by a short underframe, at the forward end of which is mounted the radiator, while the extremity of the frame rests upon transverse front springs. The small sketch shows how these are arranged. The ends of the engine underframe are shown at C, and to both of these is attached a bracket, to the top of each of which is pivoted a spring clip, D. At the bottom there are similar spring clips, E, and the two clips, D, are attached to a single transverse spring, and the same is the case with the clips, E. Each cross spring acts somewhat after the manner of a cantilever spring, but the wheels rise and fall in parallel lines, and the car should not roll as is usually the case with transverse springs pivoted only in the center.

The rear springing is another novel feature. The gear box contains a countershaft carrying a pair of pulleys, F. The rear axle consists of two short parts, G and H, each of which is driven from one of the pulleys F, and the axle members G and H are carried by a pair of springs, K K1 and L L1. It will be noticed that these are of different lengths, so that their periods of vibration are not the same, and they tend automatically to damp out excessive oscillation. The springs K1 and L1 are arranged above the axle and the springs K and L below it, and their laminations are reversed to increase still further the opposing actions so as to prevent bouncing.

A Little Criticism

The steering gear is of the cable type, the cables M passing round the reel N on the steering column.

"One small point which is not quite clear," says Eric W. Walford, an English engineer, "is how, with the ends of the



Plan and elevation of the Low cycle car design
The letters are referred to in the text

cables carried by the axles and the reel by the spring-supported frame, slack in the cables is dealt with.

"A point which one cannot help criticising is that the belts run at a very low speed. The change-speed gear is arranged in front of the belts, and only small belt pulleys can be provided, as if the rear ones were much larger these would foul the undershield. Consequently the torque passing through the belts would be very considerable, but, of course, they are in duplicate. The rear belt pulleys are built up of two thin flanges bolted together with distance pieces between the flanges, and one flange of each pulley is integral with the brake drum P."

NEW MICHIGAN TRUCK LAW

The Secretary of State of Michigan has issued in booklet form the new Michigan motor vehicle law, which goes into effect January 1, 1916. This new law requires motor trucks to be registered annually, each license being good for one year, expiring on December 31 of each year. When registration is made after September 1, half rate is charged. The two numberplates to be displayed front and rear are to be changed annually in color, and the owner is required to have a white light showing on the license plate. Dimmers are required on the front lights. The fees for motor trucks are 15 cents per horsepower, plus 15 cents per 100 lbs. of weight for gasoline or steam, or 50 cents per horsepower, plus 25 cents per 100 lbs. of weight for electric. A three-ton 25 h.p. gasoline commercial car, weighing 2,500 lbs., would have to pay \$7.50 license fee per year, and a 5 h.p. electric truck, weighing the same, would have to pay \$8.75.

ANGLO-AMERICAN CARS SUGGESTED

Advisability and Practicability of Building British Cars of American Parts

Not very long ago the suggestion was made by an English motor car journal that firms whose production was disorganized as a result of the war should have their cars built for them in America. This was said to be the only practical suggestion to overcome the present difficulty.

The suggestion has called forth considerable comment and an interesting discussion of the matter of its practicability is presented in the article herewith, from the pen of Mr. Henry Sturme. Mr. Sturme being well known in this country, where he has traveled extensively and studied the industry from different viewpoints, is perhaps better fitted to discuss such a subject than almost anyone else. His article follows:

In the first place, it may be pointed out that there are three ways in which the help of the U. S. A. may be made use of by our manufacturers, but the selection of the exact method will be largely ruled by individual circumstances. There is, first, the plan of redesigning the chassis so as to embody certain standardized components. This method has much to commend it on the score of cost, for, owing to the very large scale upon which such parts are produced in America, if the standardized models can be accepted they can be purchased at a price which will often be found to be lower than that for which they can be produced in the maker's own factory here. The cost will be certainly lower than that of corresponding components made at home.

Secondly, we have the plan of getting the parts required produced in American machine shops to the purchaser's own drawings, a method which will enable the firm to duplicate its car in exact detail and so supply its customers with the exact model upon which its name and reputation have been made. It must not, however, be expected that this can be done so cheaply as at home, because, for one thing, material, such as drop forgings, steel castings, etc., is for the most part, more expensive in America than here during normal times. The principal reason for the increased cost is that labor is paid so very much more highly in the states than with us, and unless orders can be placed on a very much larger scale than our market as yet justifies, the advantage of high specialization upon machine tool work, which reduces cost so much in the large American automobile shops, cannot be secured.

Thirdly, we have the method suggested, namely, that of getting the entire car or chassis produced in America to our own designs.

In so far as the first two methods are concerned, they present two advantages over the third. One is that the firm in difficulties may be in difficulties only with a part of its chassis. It may not, for example, be able to buy, or continue to produce, its engines and steering gears, but it may be in a position to deal with all other parts at home. Thus, by purchasing certain components only, whether standardized or to drawings, it would be able to keep that portion of its manufacturing organization going without disturbance; whereas, if the car were assembled in America, all the parts of it would have, perforce, to be made there.

The other advantage of procuring parts only instead of the complete car is a financial one, and has to do with freights, which are very high at present, complete cars or chassis being very bulky in relation to their weight. Thus, quite a small car would "cube up" some 240 to 320 feet, which, at 40 c.f. per ton, would work out at 6 to 8 tons, whereas the parts alone, closely packed, would come over on dead weight which, on parts for a light car, might not, including boxes, much exceed a ton. With freights ruling from 40s. to 105s. per ton of either dead weight or measurements, as is the case at present, it will be seen that the difference will be very substantial.

If difficulties with labor prevent work being done at all here,

then, of course, the building of the complete outfit on the other side becomes the only possible way out of the difficulty. But it is not easy, and there are difficulties in the way. Large as the manufacturing resources of America are, they are being rapidly absorbed. So great are the demands of all kinds—and particularly for automobile and munition work—of the Allies, that an enormous number of the largest producers of automobile and engineering work and material are already booked up for many months ahead. I know personally of 25 such firms, one of whom told me recently that they were working 24 hours a day all over America, and that the difficulty to obtain labor was almost as great with them as with us.

Still, I do know of several good engineering firms who have up-to-date and efficient plants, and who are prepared to quote on and undertake contract work, although some of these have, during the past few weeks, got filled up in some departments, and particularly in their tool rooms, as the demand is so great for tools and gauges for rifle and shell work. I also know of two firms with well equipped shops who would be open—if not already taken up—to undertake the manufacture of the entire car to drawings or sample parts. One of these firms is an electrical car firm, and the works is laid out to make everything but the engine. The reason that its factories—which will accommodate some 600 hands—are not fully engaged is that there is another "slump" in America just now in electric cars.

So far as American standardized components are concerned, the manufacturers of many of these are also getting full up. For instance, the makers of the Rutenber engines are sold out for the next 12 months, and the Warner Gear Co., who specialize in gear boxes and steering gears, cannot take on any fresh work this year. Most makers of such parts have now their accredited representatives here, who can advise as to the position from week to week, and, as I know most of these, I shall be happy to put anyone in touch with either of them, which will save time, as it will have been gathered from what I have already said that the pressure of business is getting very great on the other side. Although it is at present perfectly feasible for British firms to obtain help from America in the manner suggested, the opportunity may not present itself for long, so that those who take a month of Sundays thinking about it before they make up their minds are likely to "get left" when they do arrive at a decision.

In this connection I may mention that I know at least two firms here who are now absolutely out of material, and one of them is likely to be so for at least a couple of months as they left their ordering until too late. Although the U. S. firms from whom they ordered supplies are up to time with their deliveries, the long time taken in transportation owing to war conditions is throwing things out horribly. This is a case of looking ahead, and it is quite certain that firms who want to be sure of supplies for next season must look ahead a very much longer way than they have been accustomed to do, and do it at once.

THE HORSE IS KING IN OHIO

Considering the amount of money invested in various classes of horses in Ohio, the equine can still claim the title of "king of beasts" in that state. To prove his right to the crown, the horse can cite records in the Ohio tax commissioners' offices, which show that the taxable value of all horses on last year's grand duplicate amounts to \$99,099,174. The sum for automobiles is a little more than one-third, \$34,571,302.

Tax figures also dispute the statement of some that the horse industry is going backward and of others that it remains stationary, for since 1913, when the taxable value of all horses was \$92,512,504, there has been an increase of approximately \$7,000,000. All automobiles in use in Ohio were on the tax duplicate for \$25,804,992 in 1913, the 1914 figures showing an increase of \$9,000,000.

There are only three counties in the state, Cuyahoga, Hamilton and Franklin, in which the taxable value of automobiles exceed that of the horses.

A BRUSHLESS PAINT SHOP

Air Brush for Painting Metal Parts and
Stream from a Flat Nozzle for Varnishing—
Drying Temperatures and Other Conditions

By George D. Babcock*

In line with the improvements of machinery and methods for mechanical work, there has been a development no less marked in the art of applying protective coatings to the surfaces of different materials. This subject has heretofore been indicated by the term painting, but under modern methods one of the elements considered essential to painting, the hair or bristle brush, has practically disappeared. Dipping, draining and drying; flowing, draining and drying; and applying with the air brush and drying—these are the substitutes for the hair brush method.

The practice of dipping articles in a liquid protective coating

*Production manager, H. H. Franklin Mfg. Co., Syracuse, N. Y., builder of the Franklin automobile.

This article and illustrations reproduced through the courtesy of The Iron Age.

and of subsequent dripping and drying is practically as old as the harvesting machinery industry.

Applying coatings with an atomizing air brush has only within the last two years reached a prominent position in industrial work, previously being used in the preparation of canvases for art. More recently still, in fact practically a development of the last year, has come the process of stream flowing of varnishes. This process is the application of liquid coatings by means of a wide flat nozzle through which the coating is forced to flow continuously upon the surface in a wide ribbon-like stream.

As in all new processes skepticism early took the place of scientific study, and the question of durability, cleanliness and brilliancy were long debated before the present practical adoption of the methods. The virtue of these late methods has been

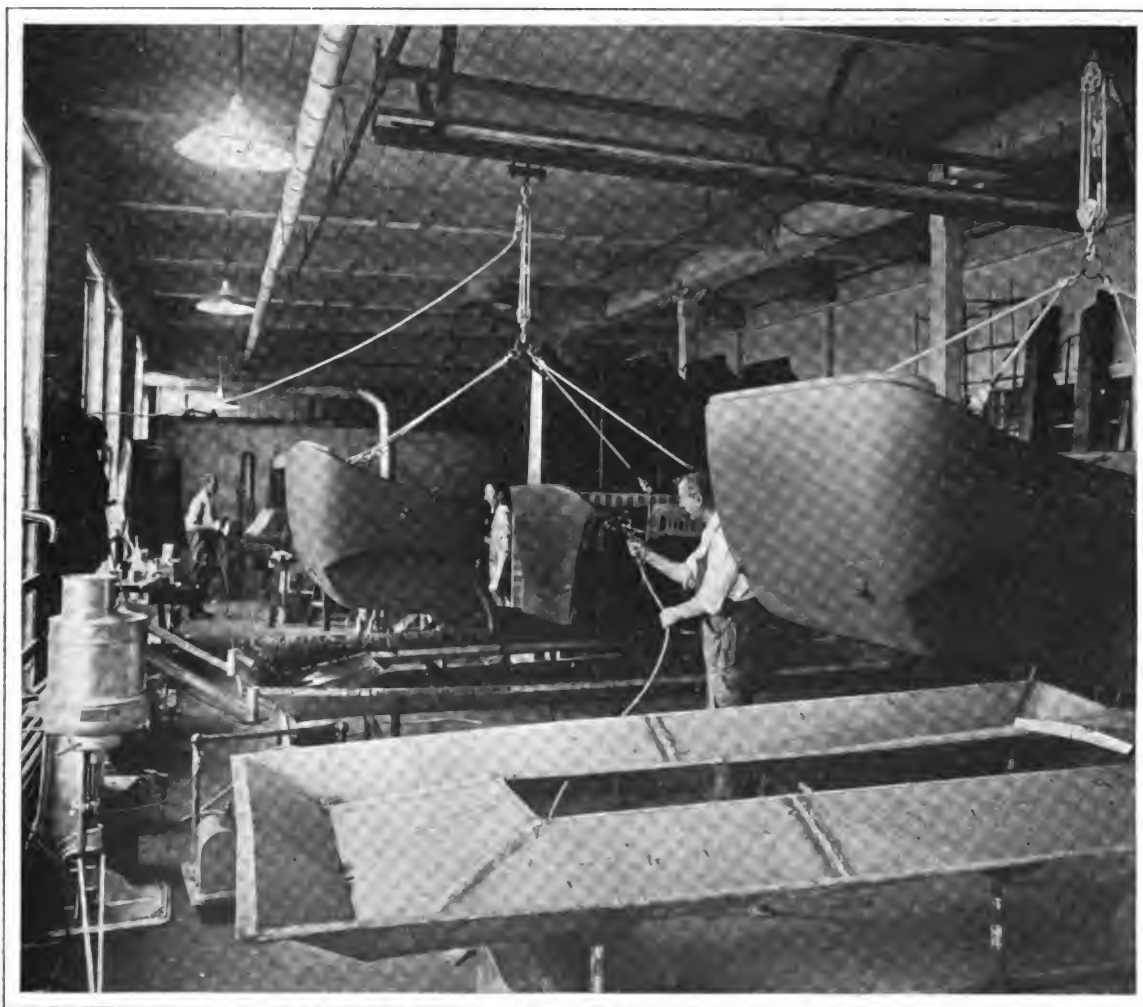


Fig. 1—The excess varnish applied by the flowing nozzle drips to the retaining pan, and flows to the centrifugal separator at the left for cleansing and mixture with fresh supplies

proved conclusively for each of the above-mentioned points.

The protection of the exposed surfaces of automobiles from the elements affecting them has required most intensive study since the beginning of the industry. Different kinds of soils, as well as different conditions of air, do not act alike on protective coatings. The continuous exposure of these coatings on the automobile requires that they be not only perfectly prepared and applied, but selected to resist the special destructive influences.

Japanning or painting aluminum surfaces presents now no particular problem to secure permanency and luster. Steel and wood have long since ceased to be troublesome.

Ten-day rubbing varnishes are dried in four and one-half hours with improved luster, cleanliness and durability.

The flowing of varnishes with the nozzle method leaves a coating as thick as will adhere to the surface.

Air drying required many coats relatively thin. High temperature drying with humidity control and frequent air change gives better results by a thoroughly oxidized tough, thick, varnish film. After such drying the film does not seem to crack or alligator as do numbers of thin air-dried coats.

In the accompanying table are shown the principal elements involved in preparing a few automobile parts with durable, clean and bright finishes in minimum time as practised at the H. H. Franklin Mfg. Co.'s plant.

Figs. 1 and 2 show how the flowing of the automobile body is done. Brewster green color varnish is used with the DeVillbus Floco equipment. The top outlines of the body are first brushed, to prevent spattering on the interior, and then the wide flowing nozzle is passed over the entire surface until the varnish not only washes off any dirt upon the surfaces, but flows in a thick uniform coat. The body is then allowed to drip and after a short period of air drying is put into the drying ovens, Fig. 3, which are heated and humidified by the Green Engineering Co.'s equipment. This varnish coat dries in four and one-half hours. The varnish which drips from the body



Fig. 2—The flat stream from the nozzle washes off the dirt and gives a thick, uniform coat of varnish

flows back through a filter into a retainer, and at frequent intervals it is separated by means of a De Laval Separator, as shown in Fig. 1. This cleanses the varnish and it is used repeatedly; the new varnish being continuously added to that in use. In the far rear of Fig. 1 is shown the so-called rough-stuff coating of the hoods by means of the atomizing air brush, after which they are coated by flowing as are the bodies.

Fig. 4 shows how the lead coat is applied with the DeVillbus atomizing air brush. A ventilating hood covers the work to take off the fumes. In the rear of the hood is shown the electric suction fans, and at the top of the hood may be seen the electric lamp enclosures for close illumination. One hose to the brush leads from the air pressure tank and the other from

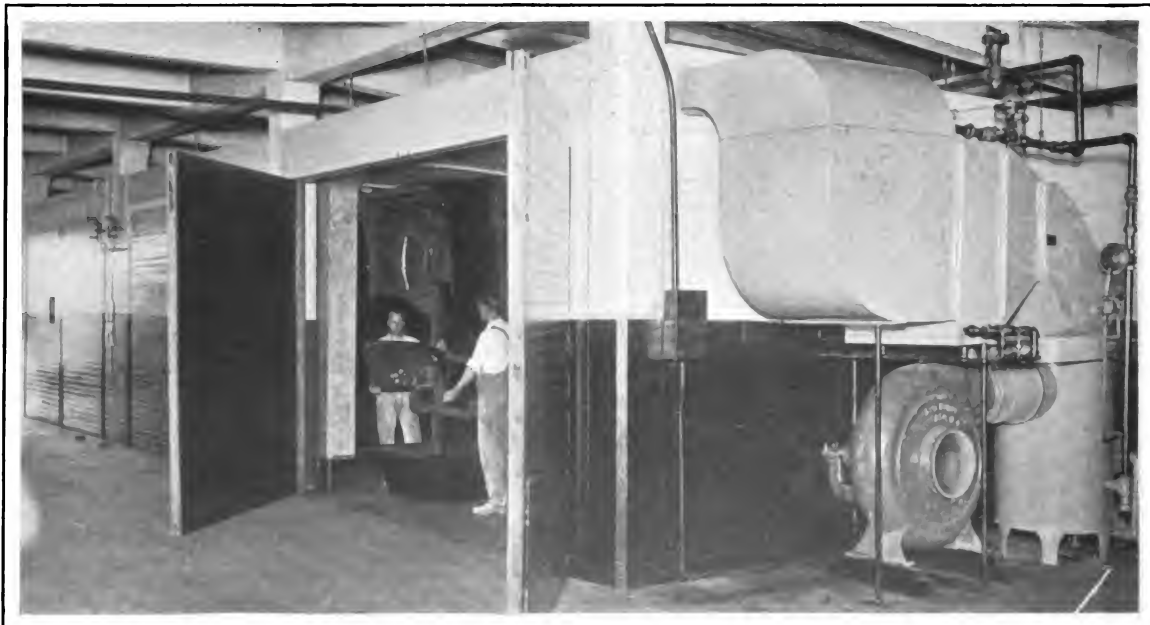


Fig. 3—The drying ovens are provided with air heating and humidifying equipment



Fig. 5—Parts for japanning are carried on trolleys, and dried in ovens with tube heating surface to keep out dust

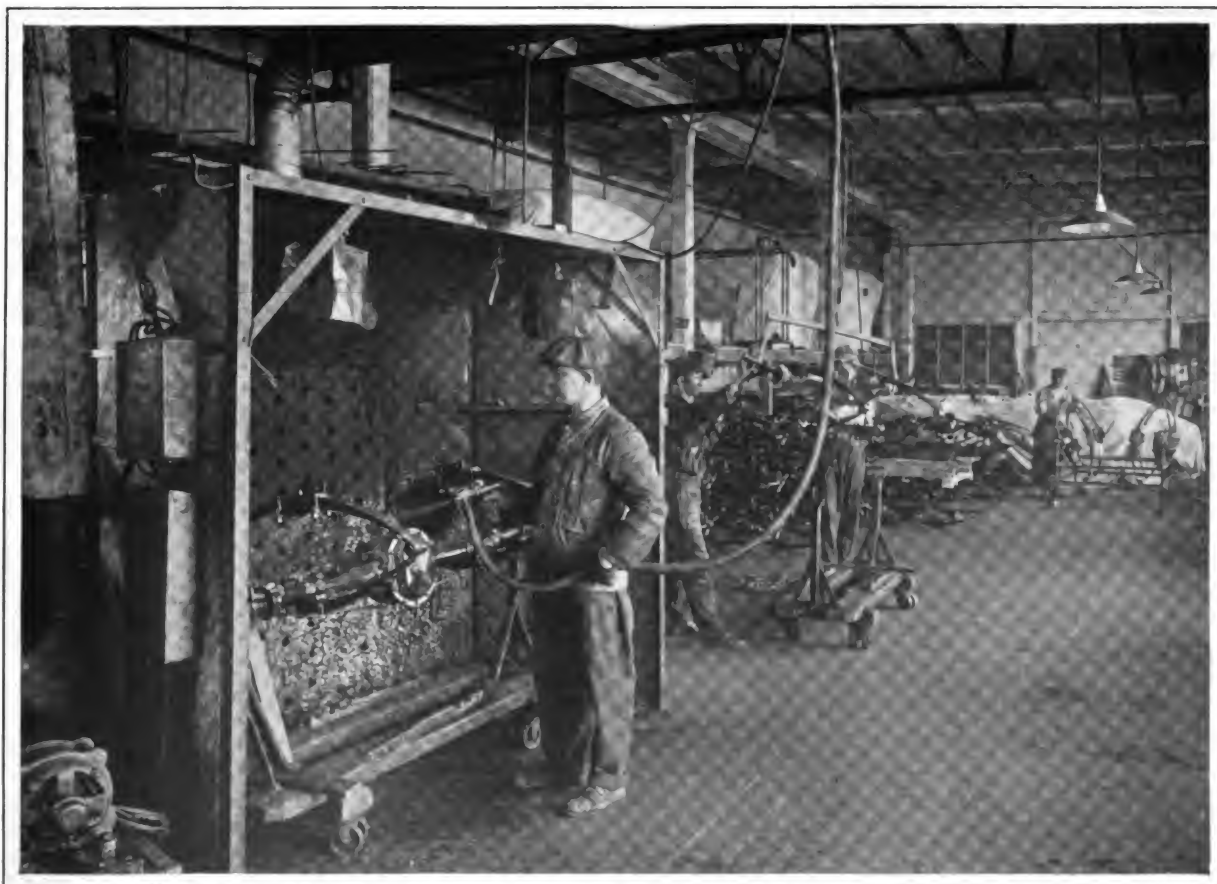


Fig. 6—Axles, finished by means of the air brush, are carried on special buggies to the painting hood

the liquid finish to be applied. The air brush spray is moved rapidly over the surface and gives a smooth uniform stippled coating. (The run, as it is called, shown in the photograph, was due to the operator's holding steady for the photograph.)

Wheels are charged to an air brush hood by means of the rolling conveyor as shown on each side of the hood in Fig. 7. After the varnish coats are applied the wheels are placed in a revolving dryer, where the varnish is allowed to set by air drying. The uniformity of the coat is maintained by the continuous rotation of the wheels. After air drying, the wheels are heat dried in ovens.

Fig. 6 shows how the axles are finished, all coats being given with the air brush.

Japanning plays an important part in the protective coatings of an automobile. After dipping in the japans, the parts are hooked upon trolleys, as shown in Fig. 5, suspended by brackets from the ceiling and allowed to drip over the pans. They are then run into the drying ovens and baked at the temperatures as shown in the table. The indirect Gehnrich ovens, shown in this illustration, do not allow the burnt gases to act upon the japans. All products of combustion are carried up the sides of the ovens in the tubes as shown. There are no draughts needed in the oven to maintain the burning gas and therefore none of the dust from the room is carried into the oven and deposited on the work.



Fig. 4—The hood for air brush painting has ventilating fans at rear and electric lights at top in the front

The part of the tannery of George Stengel, Inc., Newark, destroyed by fire some time ago, has been rebuilt and new machinery installed.

Materials Used in Coating Metal Automobile Parts and Methods and Conditions of Applying and Drying

Part	Operation	Preparation of Surface	Material in Coat	Means of Applying Coat	Means of Drying Coat	Temperature Drying Coat	Drying Time Required	Means of Rub on Coat
Aluminum body	1	Wash	Gasoline	Brush and wipe off	Air	Varnish dry, oven humidity 20 deg. less than dry		
	2	Prime	Oxide and oil	Air brush	Ovens	115 deg. F.	3 hr.	
	3	Putty	Coach putty	Hand	Air		12 hr.	
	4	Half and half coat	Lead and rough stuff	Air brush	Ovens	115 deg. F.	3 hr.	
	5	Four coats	Rough stuff	Air brush	Ovens	115 deg. F.	2 hr. each	
	6	Rubbing coat	Rough stuff	Hand	Air		12 hr.	Pumice stone
	7	Sand and re-putty	Coach putty	Hand	Air		6 hr.	
	8	Color coat	Green	Air brush	Air		4 hr.	
	9	First coat color	Varnish	Flowing machine	Ovens	120 deg. F.	4 hr.	
	10	Second color	Varnish	Flowing machine	Ovens	120 deg. F.	4 hr.	
	11	Clear rubbing	Varnish	Flowing machine	Ovens	125 deg. F.	4½ hr.	
	12	Rub out	Varnish	Hand	Ovens			Flour pumice
		Finishing	Body finishing varnish	Hand brush	Air		36 hr.	
Aluminum guards . . .	1	Wash with	Gasoline	Brush and wipe off	Air			
	2	First coat	One-half enamel, one-half oxide	Dipping	Ovens	375 deg. F.	2¼ hr.	Sand paper
	3	Second coat	Enamel	Dipping	Ovens	375 deg. F.	2¼ hr.	Sand paper
	4	Finish coat	Enamel	Dipping	Ovens	390 deg. F.	2½ hr.	
Steel and aluminum axles	1	Wash with	Gasoline	Brush	Air			
	2	Prime	Oxide metal primer	Air brush	Air		18 hr.	
	3	Putty glaze	Coach putty	Hand	Air		12 hr.	Sand paper
	4	Second lead	Lead coat	Air brush	Air		15 hr.	
	5	Ground coat	Brewster green	Air brush	Air		10 hr.	
	6	Color varnish	Brewster green	Air brush	Air		18 hr.	Steel wool
	7	Finish	Gear varnish	Air brush	Air		24 hr.	
Wood sills	1	Prime	Oxide primer	Air brush	Ovens	120 deg. F.	18 hr.	Sand paper
	2	Putty	Coach putty	Hand	Air		12 hr.	
	3	Ground coat	Colored lead	Air brush	Air		15 hr.	Sand paper
	4	Color varnish	Black	Air brush	Ovens	120 deg. F.	18 hr.	Steel wool
	5	Finish	Gear varnish	Air brush	Ovens	125 deg. F.	24 hr.	
Wood wheels	1	Prime	Oxide primer	Air brush	Ovens	115 deg. F.	10 hr.	Sand paper
	2	Putty	Coach putty	Hand	Air		12 hr.	
	3	Rub. filler	Rub. filler	Air brush	Ovens	115 deg. F.	12 hr.	Steel wool
	4	Color	Green	Air brush	Air		6 hr.	
	5	Color varnish	Green	Air brush	Ovens	120 deg. F.	10 hr.	Steel wool
	6	Stripe	Black	Hand brush	Air		2 hr.	
	7	Finish	Gear varnish	Air brush	Ovens	120 deg. F.	10 hr.	

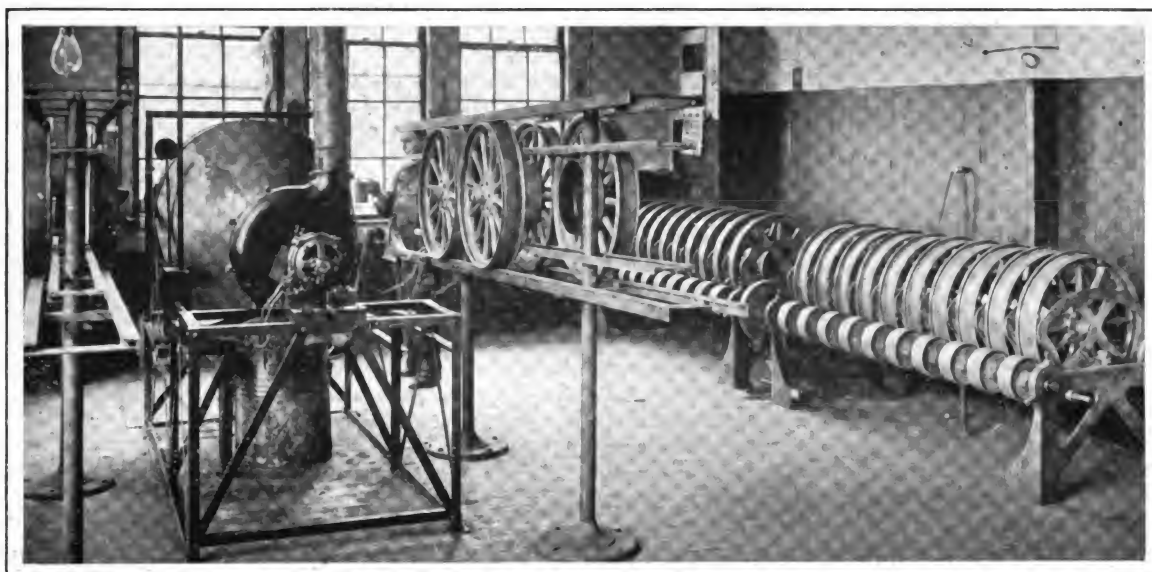


Fig. 7—The wheels are treated with the air brush and are revolved while drying in the air

THE PRESIDENT'S DINNER

In accordance with the custom of years the new president of the Carriage Builders' National Association, this year Mr. P. E. Ebrenz, of St. Louis, gave a dinner at the Hotel Astor in New York, to the members of the executive committee and to his personal friends, as guests.

The Belvidere room was very tastefully decorated, as also the guest table, and covers were laid for 24. All were present except Mr. H. B. Staver, and Mr. W. H. McCurdy, who was confined to his room with a slight illness that came on during the meeting of the executive committee which had been in session during most of the day (November 11) in the hotel.

The guests were Secretary Henry C. McLearn, C. E. Adams, O. B. Bannister, W. P. Champney, D. E. Clapp, J. D. Dort, Charles C. Hull, Perrin P. Hunter, George Huston, C. A. Lancaster, Theo. Luth, W. E. Maxwell, E. E. Parsonage, Glen Perrine, C. H. E. Redding, W. H. Roninger, W. A. Sayres, T. M. Sechler, R. S. Ward, A. M. Ware, C. O. Wrenn and Dan'l T. Wilson.

A very elaborate and beautiful menu with frontispiece done in copper plate engraving, told of the good things that had been prepared for the inner man. The dinner was elaborate and delicious. A band of vocal and instrumental entertainers enlivened the hours agreeably.

After coffee the usual custom of calling on the guests to express themselves was maintained, and the talks were not only very frank and to the point, but were to a degree confidential. Trade conditions in the buggy business were threshed out, and facts were looked square in the eyes. Perhaps Mr. Wilson's observation was the most characteristic of the state of affairs in the east when he said that only recently a hansom cab, built by Brewster & Co., and costing \$1,500 when new, was sent to the auction mart by the owner (in good condition and rubber tired), and it brought just \$5 on the block!

Mr. W. P. Champney, president of the Eberhard Mfg. Co., a man whose judgment of conditions has seldom been at fault, made the statement that the business in vehicle malleables was about equivalent, time present, to what it was in 1898.

Mr. Adams was called upon as an expert in steel production conditions and said he thought we were approaching a famine in such supplies owing to the fact that the munition makers were just getting into their stride. Those wanting steel products for commercial uses had to specify at once for future delivery, and even at that, after April the famine would set in. He instanced the profits being made by the mills by saying that

they were now asking a profit of \$60 a net ton, when \$19 a gross ton used to be thought richness.

Mr. Ebrenz gave it as his opinion that selling conditions in the buggy world have to be radically readjusted, even if a new and different class of salesmen should be required to carry out the evolution, which would be almost a revolution. His views were most interesting and progressive.

The matter of the Technical School, which has for so long been the care of the association, was discussed, and it was shown that today the automobile body designing was about the only line open to the pupils, and that it was possible the pleasure motor car makers would take up a larger share of the burden, if not all of it, in the future, as the chief beneficiaries of its admirable work. The buggy builder was no longer a designer, but just a manufacturer of vehicles that had become standardized as to design as well as cost.

There were many topics touched upon that were quasi-confidential, thus would not be permissible in a published report. The dinner and meeting was brilliantly successful.

The Executive Committee Meeting

Mr. Chas. A. Lancaster, for a number of terms chairman of the committee, resigned and Mr. Theo. Luth, of Cincinnati, was elected in his place.

A large volume of business was transacted, and the affairs of the association were found to be most satisfactory.

Mr. A. M. Ware, chairman of the Press Committee on Publicity, made a very complete report on the work of the committee the past year, and that effort was found so satisfactory that the amount devoted to the purpose was doubled, and the work ordered continued for another year. This time the propaganda in favor of the buggy will include effective posters that the dealer can make useful.

It is understood that the association will revert to the old custom of serving wine at the banquets in the future.

The last week in September was decided on for the 1916 convention, which will be held in Cincinnati.

Other matters disposed of are of interest to the association only.

France imported American horses valued at \$32,219,065, and corn and oats worth \$33,876,895 during the first 11 months of the war. For the same months of the preceding fiscal year not a horse or mule was imported from this country.

England purchased \$29,595,381 worth of horses and mules during the 11 months ending with June of this year.

AIDING GOOD ROADS WORK

That much can be accomplished in the way of good roads building, and the improvement of existing roads, by various local organizations, is evidenced by the activity and accomplishments of the Chattanooga (Tenn.) Automobile Club.

One of the principal activities of the club just now is preparing logs of all important roads out of Chattanooga. The road data is being brought right up to date by auto trips, as the last official runs for logging purposes were made several years ago. These revised logs, as fast as completed, are being printed in attractive, convenient form for free distribution to motorists who call for them when passing through Chattanooga or write for them in advance. In Chattanooga, they can be obtained from Club Treasurer C. E. Kirkpatrick, at the Citizens National Bank, or from the Chattanooga Chamber of Commerce. All this is caused by the publicity and knowledge of improvements begun. Its greatest significance is that it affords a foretaste of the tremendously increased automobile traffic to be enjoyed by Dixie Highway towns when the projected improvements become realities and the world knows of them.

Even in advance of that time, road conditions in and out of Chattanooga are far from bad. The roads to Knoxville, Atlanta and Birmingham are in good shape and are traveled daily. Even the Nashville road, with summer prevailing, is passable, but it will be some months yet probably before much besides softened excuses can be made for that route. However, it is being traveled. Both branches of the Chattanooga-Atlanta road are heavily used, the only criticism of them being that some places are rendered rather soft by work that augurs well for the near future of the Dixie Highway along that section. The Chattanooga-Birmingham road is good, much used, and the Birmingham-Memphis route is reported to be excellent. One of the nicest runs out of Chattanooga, for any distance, is that to Knoxville, the road being in good condition. Its only reported faults are those occasioned by early stages of improvement work.

JITNEY BUSES AFFECT EARNINGS OF STREET CARS

In the evidence recently submitted to an arbitration committee appointed to consider questions in controversy between the British Columbia Electric Co., which controls the street railways and electric lighting in Vancouver and suburban municipalities, the following figures concerning investments, earnings, etc., of the company were submitted by the management: The statement shows that the capital increased from \$7,000,000 in 1906 to \$9,000,000 in 1908, and by steady progression to \$46,000,000 in 1914. This was for all the British Columbia Electric Railway enterprises, including the light, gas, and power companies, and represented actual cash subscribed by debenture and shareholders. An even greater sum—\$47,300,000—has been spent in the company's undertakings in British Columbia.

The biggest dividend paid was in 1908, when on a capital of \$9,000,000 the company had earned in the previous year 7.82 per cent. In 1913-14, on a capital of \$46,000,000, the company earned 4.69 per cent., and in 1914-15, 2.76. Since then there have been no profits, not even enough to pay interest on the debentures.

One of the principal reasons offered by the company for the heavy decrease in earnings was the introduction of jitney busses, says Consul R. E. Mansfield, Vancouver, which has seriously affected the earning capacity of the property by dividing the traffic, more passengers being carried now by the motor vehicles than on the trams.

STERLING TRUCK COMPANY ADDS CAPITAL

The Sterling Motor Truck Co., of West Allis, Wis., has filed an amendment to its articles of incorporation, increasing its capital stock from \$250,000 to \$350,000. Victor L. Brown is president and R. G. Hayssen is secretary of the company.

GASOLINE AND TIRE SHORTAGE IN SWEDEN

The situation of the automobile traffic in Stockholm is becoming worse daily because of the inability to get tires, says Charge d'Affaires Jefferson Caffery, Stockholm. Now there are 25 machines out of service and next week the number will be increased.

In Stockholm there are 336 taximeters, most of which belong to persons who own only one or two automobiles. The largest company is the Taxameter Co., owning 25 automobiles. It is estimated that this company can keep its cars going until December 1. The next largest concern has eight automobiles, and it is thought that they can keep them running only a month longer. Another man having six automobiles thinks he can keep them running only another two weeks. According to an investigation just concluded, it is estimated that the traffic can be kept up two or three months longer with 150 or 160 automobiles.

One rubber company here is renting out tires by the day to automobile owners.

Automobile owners are viewing with much anxiety the lack of benzine (gasoline) in the country and are attempting to find various substitutes, but are experiencing difficulties in finding a suitable one. This lack of benzine, together with the lack of tires, makes the operation of automobiles a difficult matter at this time in Stockholm.

TECHNICAL SCHOOL HAS WAITING LIST

We are informed by Prof. Andrew F. Johnson, instructor at the Technical School for Carriage Draftsmen and Mechanics, that on the evening of October 25, when the school season opened, every desk was taken and that there is now a waiting list. This is a fine showing considering conditions in the trade at this time, says Prof. Johnson.

BRITISH EXEMPT TRUCKS FROM TAX

The order of Chancellor of the Exchequer McKenna, imposing an import duty of 33 1/3 per cent. on all foreign cars imported into England, has been modified to exempt trucks and truck parts. This was brought about by a storm of protest by Englishmen. It was brought out that American trucks have been of great advantage to the armies of England and to merchants whose trucks have been commandeered for use by the British army.

BATHS FOR AUTO CAR EMPLOYEES

A marble and tile room equipped with shower baths, for the workmen of the Autocar Co. at Ardmore, Pa., is to be one of the features of an addition to the buildings which are now being erected. This will be located in a special wing, 30 x 40 feet, which will contain lavatories, rest and dressing rooms.

MORRIS ECKHART HEADS AUBURN CO.

Following the death of Charles Eckhart, president of the Auburn Automobile Co., Auburn, Ind., Morris Eckhart has been elected president. F. E. Eckhart is first vice-president, J. I. Farley, second vice-president and sales manager, W. H. Denison secretary, and F. B. Sears, treasurer.

GOODRICH TO INSURE AND PENSION

Free life and accident insurance and a retirement pension will be given the 15,000 employees of the B. F. Goodrich Co., beginning November 1. The free insurance and pension will be thorough, and applicable to every employee with no cost to him.

Twenty-second Annual Convention of**National Implement and Vehicle Association****400 in Attendance at Claypool Hotel, Indianapolis**

The twenty-second annual convention of the National Implement and Vehicle Association was called to order in the Claypool Hotel, Indianapolis, Ind., on Wednesday morning, October 20, at 10:30 a. m. The convention was welcomed to Indianapolis and Indiana by former Vice-president Charles W. Fairbanks, representing Governor S. M. Ralston, of Indiana. J. A. Craig, of Janesville, Wis., responded to the address of welcome. President S. E. Swayne then took the chair and made his annual address to the association. The following paragraphs are excerpts from Mr. Swayne's address:

Our association has held its own in membership and revenue and has continued to protect its members in the distribution of benefits. Its influence among commercial organizations has been recognized and appreciated because of the character of its work. In traffic matters it is recognized as the mouthpiece of all lines we represent. Practical results have been secured by the work of our departments and standing committees. The members have benefited in a great many ways from our affiliation with the Chamber of Commerce of the United States, the National Association of Credit Men and other similar organizations.

The next executive committee should give careful consideration to the recommendation that a committee, composed of the heads of five concerns in our membership, shall be appointed, which shall determine ways and means for securing the funds necessary for the maintenance of a cost accounting bureau. There should be an organized effort within the association which would seek to give competing companies full cost knowledge. Intelligent competition is a proper and safe competition.

Foreign Trade Investigators

One of the most valuable accomplishments of the year has been the securing of two special investigators who have been assigned to South America, South Africa and Australia for the purpose of inquiring into the possibilities for trade in agricultural implements, farm machinery and other farm equipment.

Our association should give very serious and careful attention in the future to the great question of Rural Credits. We must avoid in this question, as in all other matters, special privilege and class legislation. The field should be open to private enterprise and honest competition, while safeguarding borrowers from oppression and investors against fraud and recklessness.

In speaking of the benefits of the Federal Reserve Bank system, Mr. Swayne said that he did not know of a time when money has been so plentiful and interest rates so low for so long a period as since the Federal Reserve Banks have opened. He stated it as his belief that there has been less business distress as a result of the European war than there would have been if the Federal Reserve Banks had not been ready to act. He then went on to give an example of how the system worked to the benefit of both the consumer, dealer and manufacturer.

Regarding tariffs, Mr. Swayne said in part: Our association has gone on record in the past in favor of a tariff commission. We should actively insist, so far as it is within our power to insist, that the tariff should be taken from politics, and that a national tariff commission, permanent in character, should be created, so that we may have wise, safe and sane legislation along tariff lines.

Concluding his address, Mr. Swayne stated that there never was a time when there was a greater necessity for such an organization as the N. I. and V. A. During a period of business depression is the time when we need each other. During times of prosperity we need the check that comes from close contact with competitors. There are constantly new conditions and new ideas arising that need co-operative thought to reap the full benefit.

Report of Executive Committee

The report of the executive committee stated that the work of the various departments of the association had been successful to a gratifying extent. The returned goods plans recommended by the plow and tillage department had been adopted; also the use of the uniform property statement recommended by the credits and collections committee. The standardization plan recommended by the wagon and plow department has also been adopted and has done more to make standardization popular and effective than any other single agency. The standardization plan of the wagon and plow and tillage department has made it possible for many of our members to eliminate half or more of the styles and sizes of their product.

The committee recommended a greater individual effort on the part of members to secure new members. A more general response to bulletins and letters of inquiry was urged in order that the returns may be representative and serve as a basis for action. Every member should feel responsible for the character and progress of all association work and should understand that helpful suggestions and constructive criticism is always welcome.

The report of Treasurer H. C. Stahl, Bellevue, O., showed receipts for the year as \$35,334.24 and a balance on hand of \$8,769.49.

Report of Secretary McCullough

The report of Secretary E. W. McCullough, of Chicago, Ill., who is also general manager of the association, was principally a recounting of the various activities and accomplishments of the association's different departments and committees. He said in part: More of our members have realized during this year that only part of their obligations to this co-operative association is discharged in the mere payment of dues and have not only loaned us their personal assistance, but that of their traffic managers and other department heads, so the accomplishments along practical lines are greater than ever before. We should have more of this kind of assistance. The work being taken up is all of practical value and it will be difficult to estimate the extent to which each member is benefited by the abolition of the old practice of donations, special exhibits, sales days, etc., also with the use of the uniform property statement, and the other recommendations of a like character which go to make up a large improvement in the marketing conditions of our lines.

While the year has been a most peculiar one and we have many times been confronted with complex and puzzling situations we have been able to meet them.

President Swayne explained to the members that reports of various committees had been printed in book form, so that members might be informed as to the work in advance of conventions and be prepared for discussion.

Adjournment was taken until 2 o'clock in the afternoon.

AFTERNOON SESSION

The interesting feature of the afternoon session was the report of W. S. Thomas, chairman of the committee on dealers' associations. The annual conference with the dealers was held in Chicago, October 14. Some 25 members were present and had a most interesting conference with about 40 of the delegates from the various dealers' associations. The matter of securing settlements on delivery was intelligently presented to

the dealers by the associations' committee on credits and collections. Many dealers are already securing settlement on delivery and we believe, said Mr. Thomas, that other dealers will see the sense and necessity of it and fall in line. We should all push this plan constantly and more vigorously than ever before.

The standardization plans of the association met with hearty approval from the dealers. Some very successful dealers have already standardized the lines they handle. It is very evident that the hard, patient work of some of our members on this very important subject has at last hit the mark and the dealers are rapidly being convinced that it is more money for them to standardize their lines and to help the factories do the same.

P. T. Rathbun gave a short address on the implement dealer, which called forth a vote of thanks for the able presentation of various problems affecting the dealer.

The subject of shorter time and cash settlement was taken up at the afternoon session. Geo. R. James gave it as his opinion that both manufacturers and dealers have a very potent factor in bringing this about in the Federal Reserve Banks. He said that if manufacturers would require closer settlement with the dealers that the existence of Federal Reserve Banks was a powerful argument to offer them when the manufacturer asked the dealer to settle, and it will not embarrass the dealer in the least in asking settlement of farmers. He explained how manufacturers and dealers could obtain money from banks on agricultural paper. He stated that the matter of cash settlement passes automatically to the dealer.

Mr. Raynor stated that lack of attention to inquirers and poor methods of collections were the only two criticisms he could make of dealers' methods.

The problem of financing and the question of long credits was ably discussed in a paper by C. S. Brantingham, of the Emerson-Brantingham Co., Rockford, Ill., and read by Mr. McCullough at this session. Mr. J. A. Craig then addressed the association and after stating that the dealers and manufacturers were facing a new era in business, he offered the following motion:

Moved, That a committee of five be appointed with power to enlarge their number to any extent they may deem necessary. That the duties of this committee shall be to make a survey of existing manufacturing and selling conditions and submit their report with recommendations to the executive committee of this association at the earliest date possible. The motion was carried by a unanimous vote.

THURSDAY MORNING SESSION

This session was devoted to consideration of traffic matters and various sales problems. The discussion was opened by W. J. Evans, manager of the association freight traffic department. He declared that changes in traffic are objectionable and burdensome to shippers. He urged members to co-operate in an effort to eliminate missing cars and advised them to use the freight traffic bureau at all times. He then entered into a discussion of traffic problems which were of interest mainly to the manufacturers.

E. J. McVann, Omaha, Neb., an attorney of the association on traffic matters, made an interesting address on "Shippers and the New Jurisprudence." He explained the many new rulings which have been read into the law through the Interstate Commerce Commission and in other ways. He received a vote of thanks from the association for the address.

W. I. Grove, sales manager of the Milburn Wagon Co., Toledo, O., made an address on "Distribution Excesses," which was a feature of the convention. The following notations are made from Mr. Grove's address:

What is distribution? It is the placing of your products in the hands of him who has use for it and has the money to pay for it. Goods are not really sold until they reach the ultimate user, and no sale is a good sale unless the article satisfies its owner by doing the work for which it was designed.

Mr. Grove then went on to give an explanation of some of the methods used in reaching out for new territory on the part of the manufacturer. He continued somewhat as follows:

I feel that our greatest distribution excess has been in attempting to play banker for the merchant who handles our goods. The farmer buys hardware, furniture, stoves and various other lines of goods for his house. What sort of terms does he get on these lines? Two fall datings, a cash discount and six months additional net—well, I guess not.

Some further remarks about the work of standardization and other efforts of the association to overcome the present unsatisfactory condition in the trade, brought this interesting address to a close and there followed a discussion of sales problems by the members.

A paper by A. T. Jackson, of the Emerson-Brantingham Co., on the subject of securing co-operation of travelers on the distribution question. The paper contained many points of interest and brought out distinctly many of the troubles confronting sales managers. The paper dealt with the various objects desired in the sales departments and the difficulty of securing the desired co-operation on the part of traveling salesmen. In closing, Mr. Jackson said: We must inaugurate an educational campaign of our salesmen whose co-operation I firmly believe can be secured in bringing about better and more economical sales methods.

THURSDAY AFTERNOON

Thursday afternoon the meeting was called to order at 2 p. m. T. F. Wharton, of Deere & Co., Moline, Ill., presented a paper on "Manufacturers' Costs." The matter of costs was discussed to some length by members and it was felt that this was an important feature of the work of the association which demanded continued and consistent effort.

Stanley H. Rose, of the United States Bureau of Foreign and Domestic Commerce, made an address on export problems. He dwelt on the lack of trade development between the United States and foreign countries and declared that the end of the European war will place the American farm implement superior to all others, as they are now in a position to command still greater trade in foreign countries. Mr. Rose suggested the teaching of Spanish in our public schools, on account of the development of the South American trade. The teaching of Spanish in the public schools would aid much in the development of salesmen to be sent to South American countries. He discussed the valuable trade markets to be developed between this country and other foreign nations such as Russia, Australia, etc. A vote of thanks was given Mr. Rose for his interesting address and the convention adjourned until Friday morning at 10 a. m.

FRIDAY MORNING SESSION

On Friday morning W. H. Stackhouse, of the legislative committee, spent considerable time explaining the different phases of the national business legislation as it affects the implement and vehicle manufacturers.

After explaining the work of his committee, Mr. Stackhouse discussed the matter of rural credits. It was freely predicted that some law enacting rural credits would be passed during the next session of congress. At the close of Mr. Stackhouse's discussion a paper on rural credits was read from G. A. Ranney, of the International Harvester Co., Chicago, Ill. The paper described briefly the German "Landschaft" system, which proved of interest and went on to say that there is undoubtedly a misunderstanding in this country of what is meant by "rural credits." Credit should not be expected to be granted solely because one lives in the country. Credit cannot be created by legislation. Legislation may, however, create the means for extending it to the proper parties. Congress has recently enacted two most important laws affecting the welfare of the farmer. We have had legislation on our books that has not had sufficient time to show what it will do for the country,

and many students of rural conditions believe that no further legislation should be enacted until the rural community has adjusted itself to the benefits recently provided for it by Congress.

After some discussion F. E. Myers, Ashland, O., presented a paper on "Shorter Terms." This paper dealt with various matters, including the action of Congress in appointing a committee to draft a bill enabling farmers to secure long loans from state, national and other banks by mortgages on farm lands. It also mentioned that the activities of the Department of Agriculture toward a system of collective buying for farmers that would, he said, destroy the present economical and efficient system which has been in force many years.

It was moved and carried that the executive committee appoint a committee of five to act with the National Chamber of Commerce on "Rural Credits." The session then adjourned until 2 o'clock in the afternoon.

FRIDAY AFTERNOON

The Friday afternoon session of the convention convened at 2:30 p. m. H. M. Cottrell, general manager of the Farm Development Bureau, Memphis, Tenn., addressed the association on "How This Association Can Assist in the Nation Wide Farm Development Work." The following are excerpts from Mr. Cottrell's address: Where business men have taken an active interest throughout their trade territories in any line of agricultural development, there has been a marked improvement in that line.

Agriculture will come to its own when the bankers and business men of this country, through national, state and trade district organizations, make strong and persistent efforts to make the yields and returns from the farms what they should and can be.

The association at this meeting should appoint an agricultural committee of five, selecting men who have the vision of what the agriculture of this country may become.

The agricultural committee should consult with agricultural leaders who have a national reputation for being progressive, and after such consultation should determine what lines of farm development it is practical for the association to push now.

Mr. Cottrell then went on to explain some tests and trials made in the different grain fields, and had much to say regarding the various crops. His address was followed by a short speech by G. R. James, and Prof. P. G. Holden, agricultural expert for the International Harvester Co., after which the convention was declared in executive session and the amendment to the by-laws abolishing the office of treasurer was adopted by unanimous vote.

After receiving the report of the committee on necrology, the following resolutions were presented by the resolutions committee. In brief:

Urging Congress to secure reciprocal tariff relations with Canada.

Declaring for an adequate merchant marine and a change in the Seaman's law.

Recommending extensive agricultural development and pledging the aid of the association to such end.

Approving any plan which will give a rural credit to the farmer and at the same time protect the manufacturer and the dealer.

Favoring the passage of the Stevens bill.

The nominating committee then made its report and proposed the following officers for election: President, A. J. Brosseau, Albion, Mich.; Jos. Dain, chairman executive committee; and seven members of the executive committee and twelve vice-presidents.

Atlantic City was chosen as the place for the next meeting of the association and the convention then adjourned.

AMERICAN AUTO EXPORTS DOUBLED IN LAST YEAR

American automobile manufacturers doubled their sales abroad last year, their exports of automobiles and parts thereof in the year ending June 30, 1915, having aggregated over \$74,000,000, against \$38,000,000 in 1914, \$2,000,000 in 1904, and \$1,000,000 in 1902, the first year of record. The gains were most pronounced in the second half of the fiscal year, and if the record made by July is maintained until the end of December, which seems probable from present indications, the total exports of automobiles in the calendar year, 1915, will be well above \$120,000,000.

All parts of the world are buying American motor trucks and passenger automobiles, about 80 different countries being represented in the year's sales. Our motor trucks are being sold most largely in England, France and Russia. In Greece, Denmark, Sweden and Serbia sales have also reached unparalleled proportions. Increased sales are likewise being made in many countries far removed from the war zone, including Canada, Cuba, Central America, Java, Australia, British South Africa, and in our own territories of Hawaii, Porto Rico and Alaska.

The year's exports of passenger automobiles were slightly less than those of 1914. Large gains in exports to the United Kingdom, Asiatic Russia, Cuba, Central America, the British West Indies, British Guiana, Venezuela and British East Africa were more than offset by numerous decreases occurring elsewhere, notably France, Germany and various countries in Europe, South America and Asia.

The constituent factors in the automobile export trade for the last two fiscal years are as follows:

Value of	1914	1915
Commercial automobiles	\$1,181,611	\$39,140,682
Passenger automobiles	25,392,963	21,113,953
Automobile tires	3,505,267	4,963,270
Automobile engines	1,391,893	1,405,334
Automobile parts	6,624,232	7,853,183
Total exports to foreign countries....	\$38,095,966	\$74,476,422
Total to—Alaska	68,435	91,381
Hawaii	1,285,258	1,514,585
Porto Rico	686,906	775,879

FRANKLIN ADDS FLOOR SPACE

Building operations that will give the H. H. Franklin Mfg. Co., of Syracuse, N. Y., one-third more floor space than at present available, are now under full sway. The three additions in the course of construction will cost approximately one-half million dollars when finished and fully equipped with machinery, and will bring the total floor space up to 10½ acres.

New buildings have been erected each year since the company first started in business back in 1902, but this is the largest single expenditure ever invested at one time for expansion purposes.

The first additional unit consists of a two-story building with basement that will be devoted exclusively to the die-casting department. This building, which will cost \$50,000, and will have a capacity of 5,000,000 die castings annually, is now practically ready for occupancy.

The second unit, a two-story saw-tooth building, will be used for machine shop, experimental department and chassis tests. Its construction is of brick and steel. It furnishes 24,000 square feet of floor space.

The last addition to be made will be six stories high and will represent approximately 136,000 square feet of floor space, and will cost \$200,000. The new equipment for this building alone will figure around \$150,000, making a total investment of \$350,000 for this one building. It will be completed about the first of 1916 and when made a unit with a companion building already in use, will form the largest factory building in Syracuse.

WHY ELECTRIC TAXICABS SHOULD SUCCEED

By I. S. Scrimger*

Electric taxicabs were first considered by the Detroit Taxicab & Transfer Co. about two years ago, although, personally, I had considered the matter two years prior to the time my company took the proposition up.

I think everyone in the taxicab business will bear me out when I say that the life of a well made gasoline car in a hard service, such as the taxicab business is, could not be much over five years at the outside. My judgment is that a gasoline car to perform satisfactorily will cost \$2,000 to \$2,500. Using the five-year period as the maximum as the life of the gas car, it means that a taxicab company is replacing their equipment every five years.

In Detroit, we get 70 cents for our first mile and 40 cents for each additional mile; single tariff meters being used. In other words, it doesn't make any difference as to the number of passengers carried, whether one or four—the capacity of the cab—the rate is the same. Comparative figures between the Detroit Taxicab & Transfer Co. and other companies in the United States show that the cost of operation per mile is between 30 and 35 cents. Taking the 30 cents per mile cost as the basis for figuring, if a cab covers two miles we receive \$1.10. If the cab returns empty, we have covered a distance of four miles for which we have received \$1.10. The cost per mile being 30 cents shows that we have lost on this run, and the history of the taxicab business throughout the United States is that from 40 to 50 per cent. of our distances covered are empty mileage. The revenue obtained from service rendered in Detroit is about 33 cents a mile. You will, therefore, see that very little profit is to be made with an expense of between 30 and 35 cents a mile and an income of 33 cents a mile. It, therefore, becomes necessary that we obtain equipment that could be operated more cheaply than gasoline cabs.

About two years ago we decided to build one electric cab as an experiment, and the president of this company and myself consulted with the manufacturers of electric vehicles in Detroit, but they were all too busy to give us much thought, and claimed they could do nothing for us unless we were willing to accept the chassis for the pleasure car they were building. The taxicab business being a commercial business, we could not see how a pleasure electric car could be made to serve our purpose. We, therefore, were compelled to build our first car. This we did under the supervision of our engineer, Mr. W. J. Behn. Our first car was placed in service at the Hotel Ponchartrain at 2 o'clock in the afternoon, June 25, 1914, and up to the present time has been in continuous service about a year and three months. No advertising was done, nor an announcement of any kind made when this cab went into service. We thought it best to start the electric service, and allow the public to judge whether or not the electric cab would meet all requirements. It was only a short time when we commenced to receive letters of approval, and the cab met with such a signal success that we decided to build eleven more. These additional eleven electric cabs went into service last December and January, and have, therefore, been in service about eight months. We are just completing 15 additional electric cabs, which will be ready between now and the 15th of October, and we have 20 more under way, which will be in service about the 1st of January. This will give us an equipment of 47 electric cabs.

It seems to me that the manufacturers of electric vehicles have not kept pace with the manufacturers of gasoline vehicles. I mean by this that the public demand better mileage and better looking cars than those that are now in service throughout the country. One of the first questions we are asked is—how many miles can you get on one charge, and then—how fast will they go?

All of our 12 cabs now in service are being operated 24 hours a day with two drivers, each man working 12 hours. To enable us to operate our electric cabs 24 hours a day, we have had installed at the edge of the sidewalk at the Hotels Statler, Tuller, Griswold House, and Ponchartrain, charging boxes, and our cabs, while standing idle, are on charge. The Edison Illuminating Co. of Detroit have co-operated with us in every way possible, and has given us power wherever it was possible to do so.

We feel that we have constructed for our service a thoroughly up-to-date, practical electric taxicab. Some eight years' experience with the gasoline car taught us the weak points of the gas car, and we have tried to overcome them with our new construction.

Our cab has a 121 inch wheelbase, and the interior of the cab body proper has a space about 68 in. long and about 50 in. wide, which you will see enables us to carry from four to five passengers very comfortably. Our experience taught us that the limousine type of body was preferable to the landaulet type, and could be operated with less expense. We are using Silvertown Goodrich pneumatic tires, and have already made a wonderful mileage showing with these tires.

In conclusion, our operating cost per mile up to the present time has not exceeded 20 cents a mile. This cost includes drivers' wages, overhead, tire expense, garage expense, depreciation and every expense in fact which is incidental to the operation of the taxicab business. The only point on which we are uncertain is the life of the car. We feel that the car has been so well made that we may be able to depreciate this car over a period of ten years. This, of course, is a problem which time alone will tell whether or not we are correct.

SOME HORSE IDEAS

The big horse advocates can holler as they please, farm sentiment is turning toward a smaller horse, writes H. O. R., Ohio, in *Stockman and Farmer*. That does not mean the real dual-purpose horse is in greater demand than ever before, he probably could not be, but we hear more often that an 1,800-pound horse is large enough for any one, and a good many don't want a horse of over 1,500 pounds in working trim. The ton-horse cry is dying out. Most of us have known all along that it was possible to get horses too large to be practical farm workers. The early demand for larger horses was all right because mighty few growers got geldings to weigh a ton. The mares were smaller than they are now and there was more necessity for breeding to a larger horse. Now, however, we are getting more weight in our mares and the stallion of under a ton with the quality and spirit in demand is more wanted than a hulk of a stallion that is not able to handle himself properly, no matter how far over a ton the scale weights must be moved to weigh him.

And at the same time that we are coming to fancy the lighter, more active drafter we are turning more attention to 1,200 and 1,400 pound horses of quality. They are liked simply on their merits. They are strong enough for most farm work, and if made of the right stuff keep their driver's ears pricked up when he takes them to town in front of a light wagon. It is the horse of quality after all that brings the price.

The buying of war horses by foreigners has done a lot of good outside of cleaning a lot of horse rubbish out of this country. The publicity given to the sort of horses they are taking and farm prices these misfits return are emphasizing in a most beneficial way the utter foolishness of raising horses of that sort. We didn't know so much about our breeding operations in this country before these buyers came in and sorted out plugs for slaughter by the tens of thousands.

A well-bred colt that is well grown is a pretty sure profit maker. An ill-bred colt that is poorly grown pretty nearly guarantees loss.

*Address before Electric Vehicle Association convention at Cleveland, O., October 18, 1915.

Electric Vehicle Association's Convention

Sixth Annual Meeting Held October 18 and 19 in Cleveland Proves Remarkably Successful

The sixth annual convention of the Electric Vehicle Association of America was held at Cleveland, October 18 and 19 with over 300 delegates in attendance, 90 representing central stations, 45 manufacturers of electric vehicles both commercial and passenger, 58 representing batteries, 65 accessories, 10 electric garage men, and others interested in the electric vehicle industry.

The convention was formally opened Monday morning with an address of welcome by Mr. Beacom Little, president of the Cleveland Chamber of Commerce. President John F. Gilchrist, in his address, reviewed the activities and accomplishments of the association during the past year. The report of Secretary A. Jackson Marshall dwelt on the stimulating work which has been done by the general office, and the reports of the various committees further emphasized the importance of this phase of the work in promoting advertising and sales campaigns.

The afternoon session was devoted to reports of committees and to two papers, one on "Industrial Trucks in the Service of the Pennsylvania Railway Co." by Mr. T. V. Buckwalter, and the other on "The Electrical Taxicab," by Mr. I. S. Scrimger. (This latter paper is printed in full in this issue of *The Hub*.)

Mr. Buckwalter's paper dealing with the experiences of the Pennsylvania Railroad in electric industrial trucks dwelt on the four distinct classes of these trucks according to their application, namely: the baggage and mail trucks used in passenger stations, warehouse trucks for freight stations and wharves, shop trucks for general indoor industrial purposes, and tractors for propelling freight cars. Some very interesting data was presented.

During the evening session Mr. Walter H. Johnson reported on the central station co-operation, recommending a closer alliance between central stations and other phases of the electric vehicle industry by the maintenance of an electric vehicle department in every central station, by the use of electrics wherever possible, both trucks and passenger cars, by establishing better charging facilities and by securing greater publicity for the electric vehicle.

An address by Mr. George H. Kelly, on "Problems We Are Facing and How They May Be Met," furnished the basis for some interesting discussion. From the views expressed it was evident that there was a feeling prevalent among the manufacturers that greater attention should be given to the care of the electric vehicle. While one of the chief advantages of the electric is its extreme simplicity and fewness of working parts, nevertheless in order to maintain the most efficient performance expert care and attention is required. Emphasis was placed on the need for more and better garages.

The concluding paper proved one of the most interesting features of the first day's session, being the presentation of Mr. Charles A. Ward's paper on "The Field for the Small Electric Delivery Vehicle." It was with deep regret that the convention heard of the unfortunate circumstances which prevented Mr. Ward from attending the convention and resolutions were drawn expressing the sympathy of every one present for Mr. Ward at the death of his father. After the reading of the paper by Mr. J. C. Boyers a motion picture followed showing one of

the Ward-Edison electric trucks which traveled from New York to Cleveland, carrying its full capacity of 750 pounds, in nine days, covering a distance of 740 miles on 165 K.W.H. with a total cost of \$8.25 or a fraction over one cent per mile.

SECOND DAY'S SESSION

At the Tuesday morning session the report of the Official Organ and Transactions Committee was presented by Mr. P. D. Wagoner, followed by the report of the Parcel Post Delivery Committee, by Mr. W. P. Kennedy. "The Comparative Development of the Commercial Power and Electric Vehicle Loads," by Messrs. H. H. Holding and S. G. Thompson, was presented by the latter, showing some interesting original data on the progress of the commercial electric vehicle. A paper entitled "The Comparative Operation of Electric and Gasoline Machines in the Same Service," by Messrs. W. J. Miller and S. G. Thompson was read by Mr. Miller dealing with tests conducted to compare the speed of acceleration and deceleration of both gas and electric machines, showing the stops per mile and the total time available for running the vehicle. (This paper is published in full in this issue of *The Hub*.)

After the presentation of this paper, Mr. E. W. Lloyd, president of the National Electric Light Association, who was a guest at the convention, gave an interesting and constructive address, the theme being a closer co-operation in the electric industries. During the course of the address he pointed out that the electric vehicle constituted one of the most important branches of the electric industry and that the Electric Vehicle Association of America was certainly to be congratulated upon its extremely practical promotion work which had gained for the electric vehicle wide and valued recognition.

Mr. Lloyd intimated that the National Electric Light Association would esteem it an honor to become more intimately associated with the Electric Vehicle Association even perhaps to the point of amalgamation, thereby strengthening what should logically be the representative electrical body, departmentized and operated in a manner to secure the greatest profit and progress to the entire electrical industry. Mr. Lloyd's remarks were effectively substantiated by Mr. H. M. Edwards, treasurer of the association, who offered a resolution that the Electric Vehicle Association give careful consideration to the National Electric Light Association's invitation, and the resolution, upon being seconded and adopted, was passed to the incoming (present) administration who will work out the necessary detail leading to consolidation and more extensive promotion of the electric vehicle.

"Electric Vehicles in Municipal Service," by A. J. Slade and R. D. Dumont, was presented by the latter. This paper and the ensuing discussion by Day Baker and S. G. Thompson dealt exhaustively with the various departments of municipal service where the adaptability and economy of the electric recommends it.

The final session Tuesday afternoon was devoted to various committees reports on insurance, operating records, and garage and rates, and to the presentation of two papers. The first paper, "The Function of the Electric Garage," by R. Macrae, pointed out the duties of the electric garage, emphasizing not only the proper storage and charging of the car, but the me-

chanical care of the various parts and accessories. Establishing more commercial garages would greatly aid electric truck owners and would be an impetus to increased commercial vehicle growth.

After the discussion following the presentation of this paper, the report of the nominating committee was given, and the officers for the ensuing year were elected: President, Walter H. Johnson, vice-president of the Philadelphia Electric Co.; vice-president, E. S. Mansfield, superintendent of the Operating Bureau of Accounts of Edison Electric Illuminating Co., of Boston; treasurer, H. M. Edwards, auditor of the New York Edison Co.; secretary, A. Jackson Marshall. The members of the board of directors whose term expired were reelected, and John F. Gilchrist was elected to fill the position made vacant by the election of E. S. Mansfield to the vice-presidency.

The last paper was presented by Willis M. Thayer, entitled "Data on the Hartford Electric Light Co.'s Experience With the Battery Exchange System for Commercial Vehicles." This paper was followed by an explanation of the plan adopted by the Walker Vehicle Co. for the rental of batteries. This paper read by Gail Reed showed the feasibility of the battery rental system when applied to passenger vehicles. A Chicago cabriolet roadster completed the 424 mile trip from Chicago to the Cleveland convention in an actual running time of 28.25 hours, including a 15 mile detour. On the third day of the trip the car made 142 miles.

Tuesday evening a banquet was held at the Hotel Statler, the attendance being 140. The speakers for the evening were John F. Gilchrist, Samuel Scovil, W. W. Freeman and George H. Kelly.

An extremely interesting feature of the convention was the numerous electrical exhibits on the convention floor. The following companies displayed their products: American Taximeter Co.; Baker R. & L. Co.; Cutler-Hammer Mfg. Co.; Electric Products Co.; Elwell-Parker Electric Co.; General Electric Co.; Gould Storage Battery Co.; Hartner Electric & Mfg. Co.; Leonard-Bundy Electric Co.; Lincoln Electric Co.; National Carbon Co.; National Electric Lamp Works; Ohio Electric Car Co.; Philadelphia Storage Battery Co.; U. S. Light & Heating Co.; Willard Storage Battery Co.

The entertainment provided for the ladies who attended the convention offered many pleasant opportunities for seeing the city. Monday afternoon was devoted to seeing Cleveland in an electric, visiting its stores, shops and points of interest, and for the evening a theatre party was provided. Tuesday a luncheon at the Country Club, and drives about Cleveland's beautiful parks afforded a pleasant diversion, and in the evening the ladies were guests at the banquet.

That the convention was a great success was evidenced by the large numbers that crowded into the convention hall at every session, in fact the attendance was surprisingly large to the very end. It is rare that so much of real value is accomplished at a convention, and the association feels that the splendid showing of general co-operation between the various branches of the industry is a very encouraging omen for an unusually prosperous year.

ROCK HILL BUGGY CO. TO MAKE THE "ANDERSON" CAR

Rock Hill Buggy Co., Rock Hill, S. C., which has been in the horse-drawn vehicle business for 30 years, is now manufacturing automobiles for both pleasure and business purposes. This part of the business will be conducted under the name of the Anderson Motor Co. J. A. Anglada, 1790 Broadway, New York City, has become chief engineer of the company and is at present superintending the assembling of the sample cars. It is expected that 500 cars will be turned out the first season. The officers of the concern are: J. G. Anderson, president; C. J. Henry, secretary and treasurer, and J. W. Anderson, manager. The car will be known as the Anderson.

LICENSE NUMBER PLATES IN NEW YORK TO BE DIFFERENT

New York state automobile owners are to have a distinctive number plate for use next year. The number on the plate will be hyphenated. A dash will separate the figures of the hundreds from the thousands. New York state is to be divided into three registration zones—New York, Albany and Buffalo. Plates have been designed for each. Automobiles registered in the Buffalo zone will carry the letter B before the numerals on the plate; those of the Albany zone will have the letter A in the same position. New York City zone plates will have no alphabetical characterization.

The 1916 plates are practically the same size as those now in use. The numerals of dark blue will have a cream background.

The use of the hyphen was only adopted after a number of experiments had been made in the State Automobile Bureau. Pasteboard number plates, bearing the five figures, both with and without the hyphen, were held for the fraction of a second before the employees. Nine times out of ten the hyphenated number was remembered. The ordinary mind showed its ability to grasp and retain the first two figures, then relaxed for the millionth part of a second, grasped the remaining three figures and fixed the whole indelibly in the mind.

In order that the new number plates may serve their purpose in the fullest sense of the word, Secretary Hugo decided to place the "N. Y. 1916" beneath, instead of before, the registration numbers, as is now the case. This arrangement effectually prevents any confusion at night when a letter or a figure may be taken in the glare of the taillight to be a part of the registration number itself.

The zone idea is an innovation. It will probably find approval in other states in which there are large cities, widely separated, and where the number of cars registered runs into the thousands.

The division of the state into zones does away with the necessity of using six figures on the plates. It also serves as an index to the locality from which the car comes.

In the New York City zone next year the automobiles will carry plates with registration numbers running from 1 to 1,000 and from 18,001 to 95,000, the city's commercial cars having numbers that will start at 3,001 and run to 18,000. There is a break in the series of numbers in all three zones from 1,000 to 3,000, inclusive, due to the fact that this series is reserved for the dealers, the number of plates to be allotted each zone being determined by the demand. The letter M, which indicates a dealer's plate, will precede all numbers from 1,000 to 3,000.

All cars registered in the Albany zone will carry distinctive plates with the numbers starting at A-1 and going to A-1,000 and from A-1,000 to A-57,000. The commercial cars in the Albany zone will have plates with the numbers running from 3,001 to 10,000, each with a letter A preceding the numerals.

In the Buffalo zone the number plates will carry figures starting with B-1 and going to B-1,000 and from B-1,000 to B-67,000, the commercial cars running from B-3,001 to B-10,000.

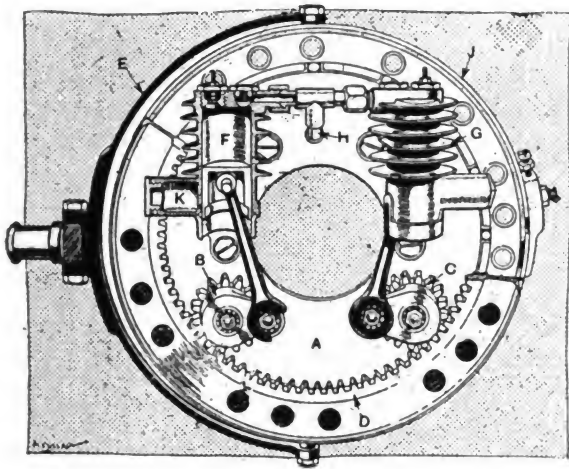
CHEVROLET TO ESTABLISH ASSEMBLING PLANTS

Chevrolet Motor Co., of Delaware, a holding company for the Chevrolet plants, capitalized at \$20,000,000, has been formed. A chain of assembling plants will be established throughout the country and the parent plant will be used for the manufacture of parts for these plants. It is planned to turn out 200,000 cars for the 1917 season. The plant of the Mason Motor Co., manufacturer of engines, and that of the Walker-Weiss Axle Co., which makes axles, are to be enlarged and production practically doubled all around. General Manager A. B. C. Hardy states that the Chevrolet Co. of Delaware will be absolutely controlled by W. C. Durant and his present associates.

A DEVICE BY MEANS OF WHICH THE PUNCTURE FIEND MAY BE DISREGARDED

One of the most ingenious inventions in mechanically-operated pumps for dealing with punctures and their troubles has been on the market in England for some considerable time in the form of the Barnfather pump. The makers of this device have not set out in any way to provide a means of repairing actual punctures, but to supply the motorist with an attachment which will keep any one of the four tires of a car board hard, even with the worst of punctures, for any length of time during which the car is running.

Instead of laboriously jacking up the car and changing rims or wheels with their numerous nuts spread about the road dur-



The Barnfather pump partly dismantled. It will be noticed that the left hand pump is shown in section

ing the operation, the labor in attaching the Barnfather pump in position is practically nil, while the time necessary to spend by the roadside is not more than a minute or two.

The principle of the Barnfather patent lies in a self-contained multiple impulse air compressor attached to the hub of the wheel by three stay rods and anchored to the running board of the car by a rod. The delivery of air from the pump to the tire is through a short length of flexible tubing.

The principal features of the pump itself are shown in the sketches, in one of which it will be seen that the cover of the device has been removed. When the Barnfather device is installed in position, the center disc A revolves in one with the hub of the wheel, and it carries on its face, with two ball bearing spindles, the spur wheels B and C. These spur wheels engage with an annular internal toothed ring D kept stationary by the hoop E, which in turn is coupled to a rod held in a horizontal position by a clip under the running board of the car.

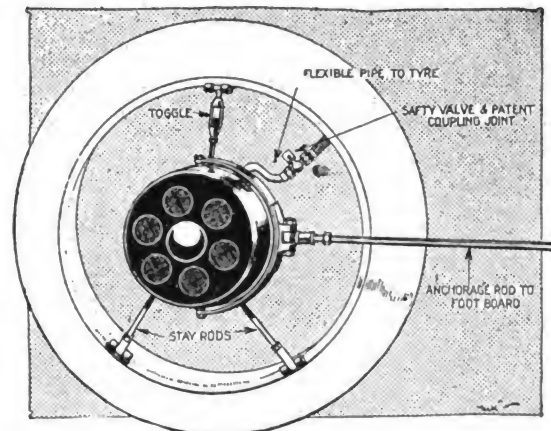
Returning to the center portions of the device, we find that there are two separate single-acting air pumps, F and G, which are bolted to the revolving disc A. The pistons and connecting rods of these two pumps are connected to small cranks revolving with the small pinions B and C. In the heads of the pumps are suction and delivery valves, and the compressed air is delivered to a common pipe H leading to the tire. Disregarding for the moment that the pumps revolve with the disc A and the hub of the wheel, it will be seen that as the spur wheels, B and C, travel in a circular direction they are compelled to rotate and operate the pumps owing to their being in engagement with the fixed ring D. Thus it will be seen that the pumps, pistons, cranks, and spur wheels revolve with the wheel in a mass, the pumps giving ten impulses in all with one complete revolution of the disc A. It is here that one of the interesting features of the Barnfather pump lies. The grip of the hoop E upon the ring D is controlled completely by the band J, which has an ingenious form of adjustment. What happens

is that when the tire has been fully deflated by a puncture, the pumps jointly give ten impulses of air per revolution of the wheel, but when the tire has been pumped up nearly to its limit, the band J begins to slip upon the ring D, thus automatically decreasing the number of pump impulses. At the same time, however, the pumps do not altogether cease working when the maximum pressure in the tire is reached, but continue to compress air which is released by a safety valve incorporated with the flexible air delivery pipe. The whole of this mechanism is covered in by a dished cover plate having large holes with gauze screens to filter the air as it is sucked into the pump. The continuous and satisfactory lubrication of the pistons in the pumps is assured by grease contained in the small cylinder K attached to the pump cylinders. As the pumps warm up with working, the grease slightly melts and issues from a small hole on to the cylinder walls and pistons.

By a special adapter the complete pump slips straightaway on the hub of the wheel, and, by a simple arrangement of three stay bars, the device can be immediately fixed in place by a few turns of the toggle strainer. The band E (see sketch) is simply connected to the running board of the car by a rod, and the air delivery pipe from the pump itself is rapidly attached to the air valve by a few turns of the patent delivery pipe connector.

Tests recently carried out with this pump found that it amply fulfilled all the claims that the makers made for it. A $\frac{3}{8}$ in. hole was made clean through an 815 x 105 mm. tire with an ice pick, the tire deflating rapidly. The pump was then installed on the wheel and the car driven away with the tire flat at the start. At the first few turns of the wheel the rim was found to be appreciably off the ground; in 150 yards the tire was inflated sufficiently enough to drive safely; in 250 yards the tire was found to be hard, in which state it continued to be after a run of ten miles.

After the termination of the run a curious phenomenon presented itself in that, after the car was garaged and the pump removed, the punctured tire remained almost fully inflated for



Sketch showing how the Barnfather pump is attached to the rim of the wheel by three stay rods, one of which is tightened up with a toggle

over one hour, and would continue in a similar condition for some considerable time afterwards. This, the makers say, was always the case after the pump had been in operation upon almost any wheel and tire, and one can only assume that this state of affairs is caused by the positions of the punctures in the outer cover and the inner tube having become altered considerably when the tire was deflated, thus retarding the leakage of air.

This device is extremely useful in cases where one has a bad puncture and not time to change a spare rim or wheel, while, of course, it is immeasurably useful in the case of touring, where one may possibly find that the reserve of inner tubes and other repairing facilities has become exhausted.

The pump can be installed on the front wheels of the car as well as at the rear, and it will continue to keep any size tire, which has been badly punctured, hard for any length of time during which the pump is installed. It certainly is an extremely clever device, and one's conviction of its capabilities is very forcibly strengthened by witnessing its action of pumping a tire while traveling upon the road.

The complete device, which is manufactured by the Fulham Central Motor Co., Aspenlea road, Fulham Palace road, Hammersmith, W., England, costs £7 10s. with an extra charge of 15s. for installing certain small fittings on the car, while the complete weight of the pump with all fittings packed in a neat little portable case is 16 lbs.

HORSES IN EUROPE

Statistics tell us that the German army requires, for complete mobilization, 770,000 horses, and she has about 4,523,000 horses. The French army is said to require 250,000 horses, which probably includes only cavalry, and France has 3,222,000 head. Great Britain requires about 400,000 horses for her army, and she has only 2,231,000. It is estimated that there are about 1,000,000 horses in active service in the different armies of Europe. It is also said that Austria-Hungary has 4,370,000, Belgium 263,000, Russia 30,000,000, and the United States 25,000,000 head.

There are five breeding farm and eighteen stallion depots in the Kingdom of Prussia, the farms containing a total of over 20,000 acres. The breeding work of the government is partly to encourage livestock breeding in general as well as for military purposes, but there are two provinces in Prussia known as the "remount provinces," where only the military object is considered. The stallion depots are most important from a commercial standpoint, and these contained 3,315 stallions in 1907. These stallions make the circuit from February to June at fees ranging from \$1.19 to \$4.76.

The French government has a breeding farm at Pompadour of 1,122 acres. Aside from this the breeding work is done through the medium of central studs, 22 in number, from which stallions are distributed throughout the country. In 1906 the French government owned and used for breeding purposes 3,321 stallions, which covered 161,414 mares at an average fee of \$1.47.

In Austria proper there are two horse breeding farms, one at Piber of 1,000 acres and the other at Radantz, with 23,809 acres. The government expenditure in Austria in 1907 was \$938,000. In Hungary the great establishment of Mezohegy, with over 50,000 acres of land, 2,000 horses and 6,000 employes, Kis-Ber, with over 18,000 acres, and Baboina with over 10,000 acres.

The Italian government does not devote so much attention to horse breeding as those mentioned, but 640 stallions stood for public service in 1906, covering 29,462 mares.

England, France and Germany are buying horses in this country, while Russia has plenty of her own. It is estimated by some that they will take at least 300,000 horses out of this country.

It costs Great Britain and France about \$300 a head to deliver an American horse at the front. The expenses are apportioned like this: \$200 for purchase, transportation \$85, insurance \$10, feed \$3, and he has from four to ten days' service in the battle line to pay for himself.

A CARRIAGE THAT SAVED AN EMPRESS

A Philadelphia carriage builder has just completed a repairing and renovating job on a vehicle which once played a prominent part in getting an empress out of the country over which her husband had ruled into another land which promised her, if not her former high estate, at least a place of security and repose.

The vehicle referred to is a four-seated, covered landau, for-

merly the property of Dr. Evans, the famous American dentist, who gained such repute in Paris as to be summoned to court to serve royalty in his professional capacity.

It was after the battle of Sedan, in the war between Prussia and France, and when rumors of the impending fall of the reigning dynasty became insistent, the wife of Napoleon III, the beautiful Empress Eugenie, was advised that it would be to her best interests to leave the capital on short notice, and in as quiet a manner as possible. In view of the secrecy necessary to get the Empress safely out of France, regular methods of traveling were out of the question. It was then that Dr. Evans, the American dentist, was appealed to, and he formed a plan of escape which was successfully carried out.

On the night of the 5th of September, 1870, the doctor provided a closed landau, to which the Empress was conducted. She acted the part of an invalid patient; a Dr. Crane took the role of her physician; Dr. Evans pretended to be a brother of the patient, while Madame Lebreton, Eugenie's lady-in-waiting, was the nurse. In this manner the party reached the open country on the road to Havre without having been subjected to undue suspicion or examination.

The landau was taken as far as Mantz, when it was exchanged for a lighter carriage, to which fresh horses were attached. The party crossed the English channel on September 8, and the Empress was joined later by members of her family on English soil. Eugenie has resided in that country ever since the establishment of the latest French republic, her present address being Farnborough Hill, Farnborough, England.

The carriage to which the Empress owes her escape from Paris remained in the possession of Dr. Evans, in Paris, during his lifetime, but was brought to America recently to be placed in the Evans Memorial Museum, in Philadelphia, for which the doctor provided in his will. Dr. Evans was a Philadelphian.

TO KEEP MARES IN AMERICA

Major General Hugh L. Scott, Chief of Staff of the United States army, is one of those who believe that these should be some check on the shipment of mares from this country to the Continent for war purposes. General Scott knows the needs of the cavalry perfectly, as it is in this particular branch of the service that he has been most actively engaged, and there is no man in the army more competent to discuss the question on its merits, as he has been stationed at various points in the west and southwest where cavalry must prove their worth daily.

"I am very much disturbed," said he one day recently at his office in the War Department, "at the figures issued from time to time showing the number of horses that agents of the belligerent nations are shipping to Europe, and the situation is particularly alarming when you consider that quite a large percentage of these animals are mares. Of course, they are taking many mares of a type that we can well afford to part with, but there must also be desirables that we cannot afford to lose. Great Britain cleaned us up pretty thoroughly on material for remount purposes when the Boer war was on, but with this stupendous conflict of indeterminate length raging nobody knows what our plight will be if we do not take steps to preserve our breeding stock. I have communicated with the Secretary of War, the Quartermaster General and the Department of Agriculture with a view to having Congress place an embargo on the shipment of mares of the type required for our purposes, and I am hopeful that action will be taken at the earliest possible moment."

SAXON GETS DELAWARE CHARTER

The Saxon Motor Car Co., to engage in the manufacture and sale of automobiles and motor cars of all kinds, has been incorporated at Dover, Del., with a capital stock of \$3,750,000. The incorporators are Herbert E. Latter and Norman P. Coffin, of Wilmington, Del., and Clement M. Egner, of Elkton, Md.

National Federation Convention

Sixteenth Annual Meeting Held at Chicago, October 12-15

The sixteenth annual convention of the National Federation of Implement and Vehicle Dealers' Association was held at the Sherman Hotel, Chicago, on Tuesday, Wednesday, Thursday and Friday, October 12, 13, 14 and 15. It was attended by 40 delegates from 12 constituent associations.

The convention was called to order at 2 o'clock on Wednesday afternoon by President F. R. Sebenthal. The slogan of his annual address was "To the Retail Dealer Belongs the Retail Trade."

In his annual report Secretary Hodge said that the association's successes the past year were largely due to the close co-operation with the National Implement and Vehicle Association.

Among the matters touched on of especial interest to the vehicle trade he said it seemed almost incredible that in one year the association should have been able to

Prevent the withdrawal of the vehicle warranty and secure the adoption of a uniform warranty that is considered equitable. Influence the withdrawal of the vehicle manufacturers' petition to the Interstate Commerce Commission, which would have endangered the implement-vehicle mixture.

Save for shippers the privilege of stopping cars in transit to finish loading and partially to unload, and

Secure for the retail trade untold benefits by the organization of a very large number of local clubs.

When you consider that the vehicle warranty has come up at practically every convention of this Federation for eight years past, and further, that at a convention held two years ago you protested against the contemplated elimination of all warranties, and that now you are about to ratify a uniform warranty which is the result of your committee's efforts, you must be impressed with the possibilities of well-organized effort when requests are reasonable and just.

The officials of our associations are in a position to render material aid in encouraging dealers to keep up their efforts to secure their share of the vehicle trade. Too much of it is being diverted to the mail order houses, due to the fact that the dealers have shown too much apathy and have allowed themselves to become discouraged on account of the tremendous growth of the automobile business. They lose sight of the fact that the mail order houses have not relinquished their efforts one iota, and the indications of the past year are that the retailers' sales in the vehicle line show a larger falling off than do those of mail order houses. I speak advisedly when I say that this condition can to a large extent be remedied, for in my correspondence with dealers I find that in many localities where they have pushed the business vigorously it has been profitable to them. Notwithstanding the inroads which the automobile business has made, there must be a great number of buggies sold. The subject is one worthy of consideration by this convention.

P. T. Rathbun, chairman of the committee on vehicle warranty, appointed at the 1914 convention, made a report of the conference held with representatives of the Carriage Builders' National Association and that the form of warranty had been agreed upon. He also reported that this form had been submitted to the Carriage Builders' National Association at its annual convention in Cleveland in September and had been approved by that body. Mr. Rathbun then read the form of the warranty which was published in the October issue of *The Hub*. The Federation voted its unanimous approval of the warranty.

In the discussion of the automobile and carriage trade, the proposition "Does It Pay the Implement Dealer to Handle Motor Cars?" opinions pro and con were offered. About one-

fourth of the dealers present stated that they are selling automobiles. One reported sales during the past season of 98 cars; another 42 cars. The dealers handling cars felt that they were not obtaining sufficient profits on this line of business, but it was the consensus of opinion that conditions affecting the profit would improve. On the other hand, there were a few dealers who stated that they had tried to handle the automobile but discontinued it on account of not being able to do business profitably. It was the general opinion that the automobile business if handled by the automobile dealer should be separated from the regular business and placed in charge of one who has no other duties. One opinion expressed was that while implement dealers may not be able at this time to obtain adequate margins on automobiles on account of various well known conditions, the time is coming when motor cars will be sold on the same basis and under practically the same conditions that buggies and carriages have been sold under for many years. In other words, they will be placed upon a merchandise basis, making it easier for the dealers to handle the business and to obtain a profit.

Two or three of the dealers, however, expressed the opinion that there would be sufficient horse-drawn vehicle trade in nearly all localities to interest the dealer who devotes a fair share of his energies to that line, and these same dealers generally expressed the opinion that the automobile trade is one that cannot be handled satisfactorily in connection with the implement business. For the vehicle trade it was stated that the business of the past year is not a criterion of what is in store for it. The conditions were abnormal, excessive rains fell over the greater part of the country and roads were constantly in bad condition. In addition to that, there has been a spirit of retrenchment and a disposition to make old jobs do further service. It was predicted that under normal conditions, both as to weather and general business, the vehicle trade next year will show a big increase over the volume of this year.

The following officers were elected for the ensuing year:

President—P. T. Rathbun, secretary of the Tri-State association.

Vice-president—C. M. Johnson, of the Minnesota association.

Directors—O. Gossard, of the Western association, and F. R. Sebenthal, of the Wisconsin association.

At the conclusion of the meeting the official board met and reappointed H. J. Hodge, of Abilene, Kas., secretary-treasurer of the Federation.

At a conference between the National Federation of Implement and Vehicle Dealers' Associations and the Sales Managers' Department of the National Implement and Vehicle Association, J. A. Craig, general manager of the Janesville Machine Co. and a former president of the National Implement and Vehicle Association, wound up the meeting with the following dramatic utterance:

"I give you fair warning that a mighty revolution is coming in the implement business. Get ready for it, and prepare your fellow dealers back home. Teach them quickly to get ready for shorter terms, a cash basis and business done on business principles. Then you will come back here and instead of presenting topics like those you hold which never bring anything to pass, we will be doing constructive work that will make the implement business the best business on earth."

PERFORMANCE OF GAS AND ELECTRIC TRUCKS

By William J. Miller and Stephen G. Thompson*

One of the many favorable arguments advanced by the electric vehicle salesman in his efforts to combat the more popular gasoline machine has been that in its field of application this type of vehicle can accomplish practically as much in a day as can the higher speed gasoline machine, and do so at a less cost.

This paper is compiled with the purpose of developing the statement from one of theoretical assumption to one of scientific fact substantiated by practical demonstration; and to do this clearly, recourse to several charts has been made, which not only makes for brevity in the paper itself but has the advantage of concise presentation.

In pursuing this argument several factors must first be ascertained, and their relation to the subject as a whole weighed to determine all the contributory causes for the existence of the belief at all. Of these factors the important ones are:

1. The speed of acceleration and of deceleration of the gasoline machine.
2. The speed of acceleration and deceleration of the electric machine.
3. The probable frequency of stops expressed in stops per mile.
4. The effect of other traffic on the highway as it relates to stops and speeds.
5. The total time available for running the vehicle.

This last is so important that it might be the determining factor in deciding whether to use power wagons at all, because with a relatively high standing time the advantages of power wagon operation over those of horse-drawn vehicles entirely disappear, as the proportion of the day when the machine is running is insufficient to make an appreciable reduction in the total running time; hence the machine can do no more work.

Now, returning to the several factors bearing upon the subject in hand, the first two, relative to the speed of acceleration and deceleration of the gasoline and electric machines, are shown in the following:

Table I

Elapsed Time in Seconds	Speed M. P. H.		Total Distance Traveled (ft.)	
	Gas	Elec.	Gas	Elec.
1.....	1.5	2.5	1.10	1.84
2.....	2.0	4.2	4.40	6.98
3.....	4.4	5.4	10.03	14.33
4.....	4.4	6.0	16.79	22.78
5.....	5.0	6.6	23.84	32.04
6.....	5.6	7.2	31.63	42.33
7.....	6.8	7.6	40.59	53.35
8.....	8.4	8.0	51.61	64.81
9.....	9.0	...	64.39	...
10.....	8.8	...	77.43	...
11.....	8.5	...	90.10	...
12.....	9.6	...	103.51	...
13.....	10.6	...	118.79	...
14.....	11.2	...	134.96	...
15.....	11.5	...	151.79	...
16.....	11.8	...	168.91	...
16 2/5.....	12.0	...	186.50	...

This shows a series of observations on the acceleration and deceleration of gasoline and electric trucks of equal load capacity and quality made under identical operating conditions, the gasoline vehicle, however, having a speed capacity of 50 per cent. in excess of that of the electric.

It will be observed that for the first eight seconds of acceleration the speed of the electric machine exceeds that of the gasoline, at which time it has reached its maximum, and that the acceleration of the gasoline machine to a speed 50 per cent. higher than that attained at this point requires practically the same time in seconds, the elapsed time, speeds in miles per hour and distance traveled for each type of machine being as follows:

*Address before Electric Vehicle Association convention at Cleveland, O., October 18, 1915.

Table II is a record of a series of observations on a delivery service in a city of 750 000 inhabitants and the surrounding towns, operating within a radius of 15 miles of the business center.

For purposes of segregation the statistics are charted in zones according to the mean distance from the delivery route to the store. The mean distance is one-half the sum of the distance from the store to the first delivery stop and from the last delivery stop returning to the store. The characteristics of the zones may be given as follows:

Zone 1—Business and city residential apartment house sections.

Zone 2—Residential apartment houses and flat sections.

Zone 3—Three-apartment flat sections and private houses.

Zone 4—Private houses in suburban towns.

Table II

Mean distance to route	No. of stops	Miles on route	Miles off route		Approx. stops per mile on route	Time factors						
			Out	In		Running		Del'y min.	Load min.	Total		
						On route min.	Off route min.					
Zone 1	0.4	9	1.0	0.5	0.3	9.0	9.5	6.5	19.0	35	1	10
	0.45	20	4.3	0.6	0.3	5.0	42.0	14.0	39.0	34	2	9
	0.45	29	6.1	0.7	0.2	4.9	42.0	15.0	32.0	43	2	12
	0.5	23	4.3	0.7	0.4	5.0	35.0	15.0	46.0	53	2	29
	0.6	25	3.3	0.7	0.6	8.0	41.5	10.0	26.5	31	1	49
	0.6	21	3.75	0.6	0.6	6.0	27.0	9.0	34.0	69	2	19
	0.6	7	2.1	0.8	0.4	3.0	11.0	6.0	7.0	6		
	0.7	11	2.5	1.1	0.4	4.4	18.0	18.0	18.0	50	1	44
	0.8	17	3.4	1.1	0.5	5.0	23.0	17.0	31.0	43	1	54
	0.85	24	3.1	1.1	0.6	8.0	38.0	23.0	48.0	38	2	27
0.9	36	3.9	0.4	1.4	9.0	34.0	13.0	57.0	47	2	31	
Zone 2	1.0	16	3.5	1.8	0.2	4.5	32.0	13.0	13.0	46	1	44
	1.0	50	8.0	1.0	1.0	6.0	93.0	35.0	114.0	30	4	29
	1.0	23	3.5	1.5	0.6	7.0	27.0	23.0	77.0	29	2	36
	1.1	40	9.0	1.0	1.3	4.5	76.0	34.0	46.0	64	3	40
	1.1	45	7.3	1.1	1.2	6.0	68.0	24.0	48.0	65	3	25
	1.1	22	3.3	1.5	0.8	6.6	25.0	18.0	33.0	44	2	2
	1.1	25	2.2	1.1	1.2	11.0	27.0	24.0	48.0	44	2	23
	1.1	21	3.8	0.9	1.4	5.5	34.0	15.0	39.0	34	2	02
	1.1	20	4.0	1.7	0.6	5.0	38.0	21.0	57.0	58	2	54
	1.4	37	5.9	1.1	1.7	6.0	55.0	31.0	55.0	49	3	10
	1.6	26	5.1	0.7	2.5	5.0	28.0	31.0	41.0	46	2	26
	1.7	46	7.7	1.9	1.6	6.0	72.0	33.0	56.0	34	3	15
	1.7	36	2.4	1.6	1.8	12.5	25.0	26.0	39.0	41	1	14
	1.8	71	20.6	1.9	1.8	3.5	181.0	98.0	142.0	22	7	23
	1.9	35	3.7	3.2	0.7	9.3	30.0	27.0	43.0	52	2	32
1.9	43	7.4	2.2	1.7	6.0	62.0	36.0	64.0	83	4	05	
1.9	42	7.0	2.2	1.7	6.0	59.0	34.0	85.0	77	4	15	
Zone 3	2.0	31	8.0	1.9	2.1	4.0	64.0	38.0	34.0	25	2	41
	2.0	24	8.5	3.1	1.0	3.0	36.0	39.0	79.0	42	4	06
	2.1	51	12.2	1.7	2.5	4.0	117.0	50.0	142.0	125	7	14
	2.1	32	4.9	2.2	2.0	7.0	39.0	43.0	55.0	40	2	57
	2.1	51	11.3	2.0	2.2	4.4	97.0	30.0	87.0	48	4	22
	2.2	40	5.6	2.0	2.5	8.0	53.0	46.0	52.0	59	3	30
	2.2	27	4.2	2.3	2.8	6.5	40.0	45.0	34.0	19	2	18
	2.6											
Zone 4	2.9	59	10.8	2.6	3.3	5.0	92.0	50.0	81.0	34	4	17
	3.0	29	4.5	2.1	3.9	7.0	55.0	47.0	34.0	51	3	07
	3.25	27	7.7	3.3	3.2	3.5	68.0	53.0	45.0	30	3	16
	3.3	43	8.2	3.3	3.3	5.2	80.0	59.0	51.0	60	4	10
	3.4	44	9.1	3.3	3.4	4.8	80.0	54.0	58.0	58	4	10
	3.7	26	5.3	3.6	3.8	5.0	50.0	58.0	36.0	77	3	41
	6.8	67	25.1	6.8	6.9	2.6	183.0	91.6	136.0	35	7	25
	8.5	53	19.6	7.2	9.9	2.7	131.0	108.0	69.0	43	5	51
1418		287.15	82.1	80.3			2488.0	1480.5	2347.5	2016	138	52

This Table II requires close analysis, as in it is contained the factors controlling the operation of a delivery system and limiting the movement of the vehicles employed. These factors are here emphasized, as they are those usually overlooked in the ordinary course of power wagon application; and because they are overlooked the popularity of the gasoline machine sways the buyer toward it regardless of the practicability of its application.

These important contributory factors are enumerated in the title heads of the table, and establish the following:

1. Probable average stops per mile:
Zone 1.....6 Zone 3.....5
Zone 2.....7 Zone 4.....4

2. Time elements in proportion to the total consumed, as follows:

Time running on route.....	29.86 per cent.
Time running off route.....	17.76 per cent.
Time delivering	28.18 per cent.
Time loading	24.20 per cent.

3. Relative values of the "miles off route" and the "miles on route" 36 per cent. and 64 per cent. respectively.

With all of this accumulated data, we have established the factors affecting the speed of movement as it relates to the total day's work performance of gasoline or electric machine, and by applying these to the different zones the efficiency of the two types of vehicles may be determined. Therefore, if we resolve all these factors to a comparative basis we will find that for equal work performance the gasoline machine will but slightly excel the electric, which difference is of little consequence when the time-saving effected is properly segregated into the different time elements of a nine hour day. For example, on the basis of the calculation in Table II, the time elements in a nine hour day would be as follows:

Time running on route.....	2 hours 41 minutes
Time running off route.....	1 hour 36 minutes
Time delivering	2 hours 32 minutes
Time loading	2 hours 11 minutes

Of these only the first two are affected by the relative speeds of the machines, the first being partially governed by the frequency of stops and the second by the speed capacity of the machine.

On an average basis of six stops per mile and a daily work performance equal to that possible with the electric vehicle, deductions based upon the facts as presented in Tables I and II would determine the daily saving of gasoline machine over electric to be 73 minutes, which for increased performance must be segregated into the time elements as follows:

Time running on route.....	21.80 minutes
Time running off route.....	12.96 minutes
Time delivering	20.57 minutes
Time loading	17.67 minutes

It will be seen that all of the foregoing is based upon unimpeded traffic when the machines are able to reach their maximum speed between stops and when running off route. Now if we qualify these figures with a consideration of the effect of traffic stops and slow-moving traffic, we then find that this apparently increased efficiency of the gasoline machine will almost entirely disappear. For proof of this we have the record of 100 days' observation of two gasoline and two electric trucks of equal capacity operating in the service of the Central Stamping Co. between Newark, N. J., and New York City. Here it was found that the gasoline machine could attain an average of only 58 per cent. of its maximum speed, while the electric maintained 72 per cent. of its maximum possible speed. Expressed in miles per hour, this amounted to 6.1 miles for the gasoline machine and 5.8 miles for the electric.

The value of this increased speed, or, for that matter, the increased efficiency as deducted in our calculations, is rather questionable when the cost of obtaining it is considered.

DEMAND FOR HORSES STILL GOOD

Motor vehicles have not lessened the demand for horses in this part of the country, according to James S. Bell, of Pittsburgh, superintendent of the Western Pennsylvania Humane Society.

"My men tell me," said Mr. Bell, "that there are more horses in the county now than there were two years ago. I believe, however, the introduction of motor trucks has had an ill effect on the treatment given horses and mules.

"The efficient work done by motors has made drivers intolerant of the physical limitations of horses and they consequently mistreat their silent partners to a greater extent than before. When the construction work began on the new William Penn Hotel I understood they were to put up the building without the aid of a horse—all the hauling to be done by motor trucks. But they hadn't been at work a week until they had

two mules hauling little cars from the steam shovel to the place where the wagons were loaded. And these two mules had a rough time of it. Everything else used in the construction work was made of iron and the men treated the mules as if they were iron, too. I had to protest to the contractors.

"I have noticed since the structural steel work has been started almost all the hauling has been done by horses. I don't believe there is much danger the horse will be entirely superseded by machinery. The automobile has made a thorough try-out now and they are still using horses. That is almost the acid test."

CHASSIS COMPANY TO CATER TO CARRIAGE BUILDERS

The Detroit Chassis Co. has been organized temporarily capitalized at \$10,000 and has leased the plant formerly occupied by the Vitralite Co., west Grand Boulevard and Hubbard avenue, where manufacturing of a standard chassis has been started.

It is the object of the new company to cater especially to carriage and buggy makers and offer them a chassis at a reasonable price.

Before the new concern decided to organize those interested in it investigated the possibilities of the undertaking and came to the conclusion that the idea was a good one. In fact the company started with several large orders, one of which is for 600 chassis for Smith & Sons, London, Eng.

Instead of putting out a chassis with a specified line of parts or components such as carbureter, ignition system, starting and lighting system, this part of the equipment will be entirely optional with the party or concern placing an order, and the price will naturally be made according to the equipment required. The chassis itself will be only made in one size, 110 in. wheelbase. The motor will be a four-cylinder block, 3¼ x 5. The wheels will be of the artillery type, with 32 x 3½ tires.

RECOVER PAINT PIGMENTS FROM USED "PICKLE"

Another highly valuable by-product recovered from waste in the manufacture of tin plate and galvanized wire, sheets and pipe, was shown with elation by a chemist in Pittsburgh recently. It was paint pigment colorings recovered from the "pickle" that heretofore has been emptied into the rivers after it became of no further use in removing scale.

This liquor contains varying percentages of acids, mostly sulphuric, and in addition to recovering the acids by refinement, there is obtained from its heavier precipitates the scale which has been so chemically acted upon by the acids that its nature is changed. From these solid particles the colorings are made.

One of the large tinning plants in the Pittsburgh district, it is stated, was persuaded to allow experiments and the results were so surprising it has authorized the construction of a laboratory for the recovery of the acids and the manufacture of coloring pigments from the solids derived. The various tints of color are attained by subjecting the material to different degrees of heat. They range from a bright yellow to a flamingo red. This material, after manipulation, is said to sell at from 7 cents to 20 cents a pound, and there is enough of it recovered from the pickling liquid thrown away daily to make it a valuable source of revenue.

BRITISH CARRIAGE MANUFACTURERS MOVE HEADQUARTERS

The Institute of British Carriage Manufacturers is now quartered at 16a Soho square, London, W., to which address it has moved from its old premises in Shaftesbury avenue.

PAINTING DEFECTS—THEIR CAUSES AND PREVENTION*

It is easier to blame paint materials than it is to blame workmanship. Materials are tangible; workmanship is intangible. To some extent materials can be examined even long after they have been applied, but there are few means of recording satisfactorily what the workman has done. Every manufacturer of paint feels more or less that if his paint were properly applied it would give perfect satisfaction. Every user of paint is inclined to feel that if he could only get the right materials he would be quite sure that he could always do good work.

The first paint defect to be considered is that described by the general terms, "checking" and "alligating." It consists in the development of fine, interlacing lines on the surface of a paint, that is, lines embracing areas, which, if small, are called checks, and which, if large, have the appearance of alligator skin. It would appear that the phenomena of checking and alligating are closely related and are probably due to the same general cause.

Every varnish manufacturer knows the cause of the alligating of varnish. All general experience points to the conclusion that such alligating is due to the application of a hard varnish over a comparatively soft under coat. The alligating of varnish is particularly noticeable where cheap rosin varnishes have been used for the under coat.

Nearly all oleo-resinous varnishes contain drying oils, which have the power of absorbing oxygen from the air and giving off certain products of oxidation, and the longer a drying oil is exposed to the air the more it becomes oxidized and the harder it becomes. There is also a shrinking in volume during the operation of oxidization and hardening. Linseed oil, which is present in oleo-resinous varnish, increases in weight through oxidation in the beginning of the oxidizing operation until it has added to its weight up to 18 per cent., but after this maximum increase in weight has taken place there is a loss in weight due to the liberation of volatile compounds, which are carried away in the air, so that after a time a linseed oil film may reach a weight very close to that which it originally possessed. During these changes the specific gravity of the linseed oil has increased, from which we must conclude that there has been a reduction or contraction in volume.

We can readily see how in the case of one coat of varnish placed over another under conditions in which the first coat has not had a sufficient chance to thoroughly harden before the second coat is applied, the second coat on drying will contract and decrease in volume, while the first coat will remain practically unchanged in its volume and in its degree of hardness.

Now in all cases the outer coats of varnish and paint tend greatly to shrink in volume and to become progressively harder and more coherent, thus producing two possible effects. One of these possible effects is the rupturing of this outer coat with consequent alligating or checking. The other possible effect is that the outer coat becomes thinner without rupturing.

Which of these effects occurs depends upon the under coat. If the under coat is soft, the outer coat, in oxidizing and shrinking, will draw up and slip over it with consequent rupturing. If the under coat is sufficiently hard, the outer coat does not slip over it and simply becomes thinner by shrinkage, and no rupturing occurs. This is the general explanation of the alligating of varnish and paint.

This explanation is one that is quite generally accepted, although there may be minor points on which there is disagreement. Now, if this is true, in what way does checking differ from alligating? From the writer's experience, the causes of checking are identical with the causes of alligating, and

he has experimentally produced a series of paint defects beginning with very fine checks on one side, and ending up with very large alligating on the other side. If alligating takes place, it simply means that the under coat is relatively much softer than the outer coat. If checks occur, it means that this difference in the hardness of coats is not so great as in the case of alligating, but the difference is in degree, not in kind.

In order to avoid checking and alligating, it is best to seek to have the under coats as hard as is practicable, and to have these coats, relatively speaking, much harder than the outer coats. This is the practice in coach and carriage painting, where very little oil is used in the under coats, and as we know coach and carriage painting is, perhaps, the best type of painting there is.

J. Cruikshank Smith, an English writer, in his book on "Paint and Painting Defects," thinks that the terms checking and alligating, which he says are of American origin, are unnecessary terms, and it would be better to describe them as cracking. Cracking, however, as the term is used here, involves parting of a paint film right through to the surface painted. He says in his book: "Very often it (cracking) is caused by the final coat being less elastic than the under coat, or again, the last coat may have set too quickly, or may have been applied before the previous coat was quite hard."

All this is in line with what we have said before, if we understand that Mr. Smith is referring to the cracking of the outside layer or layers of paint. In regard to varnish, he also says: "This (cracking) is due in the main to causes similar to those which govern the cracking in paint or enamel." Speaking of graining, he also says: "As a rule, graining cracks on account of the graining color lacking elasticity, or because it has not been modified to suit the ground. If the ground is too oily, the application of the graining color may soften the ground, and unequal expansion and contraction, as between the color and the ground, take place. Cracking will also be induced if the varnish applied over the graining color is too hard and non-elastic."

In all paints a drying oil is used. The drying oil should have in a high degree the power of being oxidized into a solid substance. Linseed oil is the principal material used by painters for this purpose, and it should have this drying quality in the highest degree. The use of linseed oil substitutes which are liable to be deficient in this respect should be carefully avoided. It is important also that those pigments which retard the drying or hardening of priming coats should not be used in excess. This refers particularly to lamp black and yellow ochre. Other pigments of a similar nature will suggest themselves to users of paint. On the other hand, pigments which assist in the drying and hardening of under coats should be used as far as is practicable.

Probably the most important thing to do, in the avoidance of checking and alligating in the ordinary use of paints, is to allow as much time as possible between coats.

CARRIAGE FACTORIES, LTD., FORMS CANADIAN BRISCOE CO.

Carriage Factories, Ltd., of Canada, has formed the Canadian Briscoe Co. as a subsidiary. The latter will assemble the parts in Canada from the American Briscoe Co., the cars of which will be sold through the Carriage Factories company. This company has acquired the carriage manufacturing end of the McLaughlin Motor Car Co.

WILL KEEP LOZIER PROPERTY*

The Associated Lozier Purchasers who took over the assets of the old Lozier Motor Co., Detroit, Mich., for \$1,000,000 and who had the privilege of reselling the property, consisting of the plant and land in Detroit, have notified the Detroit Trust Co., trustee, that they will keep the property.

*An address by G. W. Thompson, chief chemist, National Lead Co., delivered at the eleventh annual convention Maintenance of Way Master Painters' Association of the United States and Canada, and at the semi-annual meeting of the American Institute of Chemical Engineers.

Tri-state Vehicle and Implement Dealers'

Seventeenth Annual Convention

Discussion of the Future of Vehicle and Implement Business—Movement for Reform in Selling Methods and Terms

The seventeenth annual convention of the Tri-state Vehicle and Implement Dealers' Association was held at Cincinnati, O., October 27 and 28. The attendance, though smaller than usual, included some of the strongest and most progressive dealers in Ohio, Indiana and Kentucky, the three states covered by the association.

The first session was called to order by President H. C. Otterbacher, who said in part: I think you are all familiar with the work of our organization and the relationship we are trying to establish among our dealers. We have tried hard to devise means whereby the dealers of a locality can be brought into closer relationship, and this has been very successfully done in many localities by local club organizations. On account of business depression we should all draw closer together. The old saying, "United we stand; divided we fall," can well be applied to the vehicle and implement business.

After sundry remarks on the growth of the association and the necessity of each member making personal effort to increase the membership, Mr. Otterbacher concluded by urging all to put their shoulders to the wheel and aid in making the coming year a banner one in progress.

Secretary Rathbun's Report

The annual report of Secretary P. T. Rathbun touched upon most of the live topics of interest to the vehicle and implement dealers today. The following paragraphs are excerpts from his report:

From most of the territory covered by your association there have come reports of a fairly satisfactory business in implements, while the vehicle business has been of an irregular sort. Some few localities report the best vehicle business in five years; others about a normal business in vehicles; while the greater part of our members report trade as very quiet in this line.

The importance of early buying is apparent in that the early buyer will have all the advantages as to delivery of goods at the time desired; as well as being practically assured that the goods will be bought at as low a price and doubtless lower, than the late buyer for the coming season's requirements.

Standardization is a very important subject from the viewpoint of the dealer and the farmer as well as the manufacturer. It seems quite a start has already been made at standardization by some branches of the implement and vehicle trade. It is certainly advisable that styles, sizes, and variations of practically all the goods you handle should be reduced materially. This will make possible a great saving in manufacturing and distribution costs; and this will result in lower prices to the ultimate consumer of these goods, without a sacrifice of utility. We urge our members to co-operate with the manufacturers that the lines and stocks of each may become as nearly a standard as possible.

Through a joint committee appointed by the National Federation and the Carriage Builders' National Association, a uniform vehicle warranty was drawn up at a conference in Kansas

City in January last. The same was referred to the C. B. N. A. at its annual convention in Cleveland, and to the National Federation convention in Chicago, both recently held, and was adopted by each as the official vehicle warranty. We believe this warranty is equitable and fair, and urge upon our membership to observe the spirit of same in event of defect in vehicles handled by them. This adoption seems to dispose of a somewhat vexatious question in a manner fair to all concerned.

Mr. Rathbun went on to say that it should be an object of the dealers to obtain cash or short time bankable notes for the goods sold to the farmer. He felt certain that shorter terms were an assured fact for the near future and suggested that the dealers make themselves ready for them.

The subject of cost education was briefly touched upon and the members invited to make inquiry and application of the association's cost educational recommendations and findings.

The past year to most of us, and to practically all of the manufacturers, has been one of reduced vehicle volume, and rather unsatisfactory conditions as a whole. Some of these conditions can doubtless be justly attributed to the war; some to the unusually wet summer; quite a lot of it to the automobile; but it seems to me quite a good deal to the negligence of the factors in the vehicle trade, including dealer, traveler, and certainly the manufacturer. I venture the assertion that if the automobile dealer and buyer had no more of encouragement or effective publicity than has the vehicle dealer or buyer, that the automobile trade would not be anywhere near as large as it is today. In the face of reduced volume of factories and dealers doing business in the regular way, the mail order or direct selling concerns report a larger trade than usual in the vehicle business the past season. It certainly seems, if this is true, that there is something wrong in the way we view the vehicle business. Perhaps we are all of us too content to sit and wait, and while waiting, sliding out of rather than into better business and conditions. We hope from the discussion of this subject as provided by our program, that some line of action or support will be evolved that will make for the betterment of the regular vehicle trade. We must be more alert or the trade will pass from its accustomed channels.

Mr. Rathbun had something to say about the matter of handling light weight farm tractors and the terms upon which they were sold by the dealers. He said that where the goods were sold, as are other farm equipment lines, the dealers are entitled to a fair commission, sufficient to cover cost of doing business and a reasonable profit.

The exhibit this year is not so large as formerly, but it is comprehensive in that it covers all the classes of goods handled by the members, and should be educational and interesting.

After mentioning the activities of the National Federation resulting in benefits to the dealers, Mr. Rathbun concluded by calling attention to the necessity of all dealers giving careful thought and analysis to the trade and conditions and urged participation in the convention proceedings as a means of advancing the interests of each other.

The report of the treasurer, Geo. W. Young, showed receipts for the year of \$8,737.91 and disbursements of \$8,597.48, leaving a balance of \$140.43 on hand.

Future of the Trade

The future of the trade was discussed for the vehicle industry by C. T. Egolf and W. F. Brunsmann, and for the implement business by P. C. Kirtley and Ed. S. Ralph. Mr. Egolf's paper, as an "X-ray view," so to speak, of causes of decline in vehicle lines, and an incentive to the dealers and manufacturers to go after a trade which is rightfully theirs and to be had for the intelligent seeking, is worthy of careful reading. We print it herewith:

The Slump in the Vehicle Trade

To my mind, gentlemen, the time was never so opportune for a discussion, sober, serious discussion, of the future of the vehicle trade. To discuss the subject intelligently I think that it requires the linking as it were of not only the dealer, but the manufacturer and the buggy salesman. I think the three should be linked together and work in unison. That, to my mind, is the only way to get results. But I fear that this harmony has not always existed in the past; consequently the evidence has been before us during the past year that something is wrong.

In a discussion of this kind I believe more will be accomplished if all of us were as free and aboveboard in our statements to each other as we are to ourselves when we compare our sales sheets and our trial balances with those of former years.

Then, let us all admit right now that the buggy business was not as good this past year as it was in former years, but my idea is that right now is the time to forget all about last year. Forget the falling off in business, and set out to locate the cause. Locate our troubles, ferret out where we ourselves were weak, and I am sure if every vehicle manufacturer and every vehicle dealer will take an inventory of himself, he will find that the depressed buggy business can be attributed not to automobiles alone, but to a combination of circumstances which had its effect on lines which would not possibly have been affected by the mushroom growth of the automobile industry.

Of course, the automobile has made inroads on the vehicle industry, but haven't you, me, and my fellow manufacturers allowed ourselves to be completely over-ridden by the superiority of salesmanship on the part of the automobile manufacturer on the one side and the catalog and mail order houses on the other? We have practically quit on our oars; we have allowed the boat to drift along until we have seen our sales diminished, and we have been trying to reconcile our weak efforts with the idea that the buggy business was doomed to a sure death, and the question of buggy sales was not worth the effort.

The buggy business is not a dead one. It is my personal opinion and conviction, due to some sober thinking of late, that if you dealers and we manufacturers will come out of the trance into which we have fallen it is within our power to increase our buggy sales to a profitable and a worth-while standpoint.

I ask you candidly what amount of real effort have you put forth this past year to really make your buggy sales what they should be? It makes me ashamed as manager of sales for a vehicle manufacturing establishment to think that all we manufacturers and you dealers have allowed other interests antagonistic to our ways of doing business to step in and take from under our very noses business which by every right we should have had.

Does it look like the buggy business is dead when I tell you that every mail order house in this country did more buggy business last year than the year before? It is a fact, nevertheless. Consequently, I say to you that we have all been laying the blame for our decreased business entirely on the automobile, and in our sleep the other fellow has crept in on us and has stolen business which should never have gotten away.

Pin this prediction in your hat as coming from me: There isn't a man in this hall who will live to see the day when old "Dobbin" will be no more. As long as he is with us there must be buggies to hitch him to. It is true there will never be as many buggies made and sold as there once was, but that decrease, at least the largest part of it, can be traced to the absence of the use of the horse in the city. To the city man the upkeep of a horse is great; the buggy horse never was a necessity, but was used for pleasure, and if any of you have ever experienced the upkeep of a horse and rig in the city you will realize then why the automobile has superceded it.

The legitimate channel of trade for the vehicle dealer and the vehicle manufacturer is in the rural district. Every farmer has his horse and regardless of his automobile he will have his buggy to hitch him to. Perhaps you will say, yes, he needs a buggy, but he doesn't buy as many, and he isn't so particular as in former years as to what he buys. That is the very point I wish to bring out, and it is one of the causes of you and me allowing the other fellow to get a foothold on our trade.

Mr. Automobile Owner who also uses a buggy doesn't care so much for details as he used to. It doesn't take so much to please him in his buggy. He is looking for an article in which he feels he can ride with a reasonable assurance of safety, and he wants to buy that article at less than what he would pay in former years.

Have you and I, therefore, in deciding what we will manufacture and sell, given this phase of the industry its proper consideration? Have we taken the time to investigate what the buggy buyers really want and must have? It is my conviction and my earnest belief that the increased buggy business done by the mail order houses has been accomplished solely because of the fact that the man who is using buggies today is after bargains, and the other fellow has been able to make the user believe at least that he could get a better article at a less price than you and I were able to supply. That in my opinion is one of the faults of the vehicle industry today. We have not taken the time nor we have not taken enough interest in our own line of business to sit ourselves in front of a mirror and locate our own weaknesses. It is up to you and me to revolutionize the entire vehicle game, and we must fortify ourselves with the right kind of ammunition with which to fight the fight.

There will be buggies sold—plenty of them. There are not as many manufacturers to build them as there used to be. There are not as many dealers to sell them. Then, if you and I pursue the proper tactics, if we are willing to pull off our coats and work as we ought to work, we will both find our calculations and conclusions which we based on past experience to be founded too much on being satisfied to wait for Mr. Buggy Buyer to come to us instead of we going to him with what he wants at the price he wants to pay.

Let us prepare ourselves to give the buggy user what he wants. There is plenty of business to be gotten if we are satisfied to go after it. But to get it remember this, you as the dealer and we as manufacturers must make up our minds to build and sell the class of buggy which the buyer demands and at the price he wants to pay.

Last, but most important of all, don't you think that a better understanding between the dealer and the manufacturer is essential to progress? Where can you find a line of manufacture where so little co-operation has existed between manufacturer and dealer? You dealers and we manufacturers should lie in the same bed; we should formulate lines of campaign, we should conduct selling schemes both from your office and from factory direct, you should welcome our salesmen to help you close prospective buyers, in short, what you need and what we need is a great big physic.

Let us rid ourselves of our foggyisms. Let us get closer together. We should find out what is wrong with us. It isn't all the fault of the business. The business is there in a great deal larger quantity than we have been getting and if you and I will roll up our sleeves and let the world know through pro-

gressive advertising—progressive and combined salesmanship of both yourselves and the manufacturers—that we have buggies to sell and that we have what the buyers want at the prices they want to pay we will do business all right, and plenty of it.

If I had the persuasive power at my command to impress upon your minds and the minds of my fellow manufacturers that if we would all get together on common ground, map out the progressive campaign of buggy publicity which it needs, and then work with each other as we ought to work, I am sure such a meeting would be productive of results, and you would see buggies sold where you now think it impossible.

You and I have been asleep at the switch; we have really wrecked the old express ourselves. Now let us awaken. Let us pick up that lip which drags so low we step on it, and get together for the common good. There are results to be accomplished, and we can do it. In my opinion it is up to us.

The address of Mr. Ralph, in regard to the implement business and its prospects, dealt with the various matters of interest to dealers, including the matter of cash payments; the necessity of going out after the business and the advantages of co-operation. His remarks were well received.

The address of Mr. Brunsmann dealt principally with the necessity of the dealer going after business. He said in part, as to the

Future of the Buggy Business

A few years ago when the buggy business was right in its "hey dey," the prospective purchaser came to you and wanted to know what you had to offer him in the way of a horse-drawn vehicle. All you needed was an attractive looking buggy, one that you could sell at an attractive price, and the sale was made, provided there were no obstacles in the way, such as credits, payment, etc. But, are you dealers content to wait for a prospective buyer to come into your store? Don't you find where formerly ten came, now you only have one? Your field is somewhat limited, yet there are a great many people in your very territory who are going to buy buggies.

Now from reliable sources we understand that the catalog houses have enjoyed a bigger trade the past year than they have for several years previous. Why is it? Because they have been more aggressive than formerly—or is it because you have not been so aggressive or so keen after the business?

You have a great big advantage over the catalog house. You do not have to depend upon cold type to get your message over, but you have the advantage of personally canvassing and of putting a "punch" into what you say. I have never been a buggy dealer, but I do know to make a sale it is necessary to show some interest, and I believe the farmer appreciates a personal visit and a personal canvass more than any of us can realize.

Yes, I think there is a future for the buggy business. If I did not I would not care to remain in it. I know there is a lot of psychology in matters of this kind. Every time we pick up a paper we read about automobiles—everybody is driving one. We, you dealers and we manufacturers, think, well, the game is a dead one. But if we are going to remain in the game we must get over these thoughts, we must realize that our field is more limited, and that we cannot hope to accomplish anything by merely scratching the surface.

There is no article that can be considered of a better value than a buggy—anybody's buggy made by any reputable manufacturer, and make a good margin of profit. You don't have to be ashamed nor let your conscience bother you when offering it to your prospective buyer.

Mr. Kirtley, speaking of the implement trade, stated that in his opinion the future of the business depended upon the future of the farmer and any improvement in farming methods would be reflected in the implement trade. He urged greater co-operation on the part of the dealers, with the manufacturers.

Mr. J. A. Craig, of the Manufacturers' Association, made an address which consisted mainly of an explanation of customs and practices existing today and the probable changes that

would occur in the near future. His address was enlivening in many ways and we give herewith several excerpts from his general remarks:

The first thing I will mention is our terms of sale. We have been making July date of payment on tillage tools for spring trade and November 1 for fall trade with 30 to 60 days' extension on these dates for seeding machines and planters and cultivators, and four, six or eight months on vehicles, and anywhere from six months to two years on harvesting machinery. We have come to think if we were to change these terms of sale we would break the law, or by bringing them up to date we would cause an investigation by our new trade commission.

Can you give me any good reason why you as a merchant in your community whose sole business it is to buy and sell goods and we as manufacturers who make these goods should be compelled to put from one and one-half to three times the amount of capital into our business that our sales amount to?

The terms of sale must be shortened in the implement and vehicle line and you must get ready for the change, for it is surely coming.

The time is coming, and is right close at hand, when our prices will be based on the service furnished with the sale when it is made, and you will have to govern yourself in dealing with your trade in a like manner.

Buy only what you know to be standard sizes and carry only such in stock. Carry a less number of styles of a class of goods but a larger variety of different kinds of goods in your line. In other words, have something to sell the year round. Your expenses are running on every day in the year.

Mr. Craig also spoke on the advisability of securing legislation in Congress on the matter of rural credits. He also spoke on the subject of the traveling men adapting themselves to the new methods to be soon put in force and urged co-operation on the part of all dealers in attaining the desired objects of the association.

The session closed with an address by C. E. Merkel on "Local Clubs."

Final Session

The second and final session of the convention opened with an address by T. J. Turley, a delegate from the Tri-state association to the National Federation. He spoke at some length on the activities and accomplishments of the National body. The various works of that organization have been published from time to time and need not be printed here. They were presented to the dealers with the object of creating a greater interest in the organization and increased activity in both local and national association work.

The report of the resolutions committee covered the various subjects of Conditions and Outlook, Local Clubs, Standardization, Early Buying, etc., etc.

The election of officers was as follows:

President—Chas. S. Darnaby, Lexington, Ky.

Vice-presidents—T. J. Turley, Owensboro, Ky.; W. J. Bulleit, Corydon, Ind.; C. E. Merkel, Marion, O.

Four directors were also directed and three delegates to the National Federation.

Directors, one year—W. G. Dorman, Corinth, Ky.; two years: H. A. Lowery, Leitchfield, Ky.; W. G. McMaken, Fort Wayne, Ind.; H. C. Otterbacher, Wellington, O.

Delegates to National Federation—T. J. Turley, Owensboro, Ky.; G. P. Wagner, Jasper, Ind.; C. E. Merkel, Marion, O.

Alternates—C. S. Darnaby, Lexington, Ky.; W. C. Framp-ton, Pendleton, Ind.; E. H. Huffman, Columbus, O.

The convention then adjourned.

ANNOUNCE TWELVE-CYLINDER ENGINE

The latest twelve-cylinder, or twin-six engine to make its appearance is that manufactured by the **Ferro Machine and Foundry Co.**, of Cleveland, O. The engine is 2 $\frac{7}{8}$ x 4 $\frac{1}{2}$ in. and develops approximately 70 h.p.

AMERICAN FACTORY METHODS AS SEEN BY AN AUSTRALIAN BUILDER

Mr. A. Yorston, a well known Brisbane coach builder, returned last month from a visit to the United States and Canada. In passing through Sydney, Mr. Yorston favored us with a call, and at the same time gave some of his impressions of American and Canada. Mr. Yorston has two brothers engaged in farming in Canada and the United States, who formerly were residents of Queensland. They would, he said, like to get back, as they consider the climate of North America, especially Canada, as inferior to that of Queensland. Canada and parts of the United States have droughts, and, in addition, have severe frosts and hailstorms which often cause heavy losses. The season in Canada is only from May to the end of August. The frosts start in September, and cultivation is not possible until the following May. If Canadian farmers were to come to Australia, they would think themselves in Paradise.

As regards manufacturing, Mr. Yorston considers Australia has a lot to learn, particularly in comparison with the United States. Instead of making a customer what he wants, manufacturers build what suits themselves, and customers have to take what is offered them. Everything is reduced to types. In vehicles, there are none of the fine distinctions we find here in Australia, designed to suit the individual fancy of the purchaser. Everything is built very light. In buggy tires the usual size is $\frac{7}{8}$ in. At Winnipeg he endeavored to get a two-seater buggy with 1 in. tires. He had great difficulty in doing so. Every two-seater he saw, excepting one, had $\frac{7}{8}$ in. tires and 15/16 axles. The wheels of a two-seater he bought had inch spokes. It was a corning shaped body, on three plate elliptic springs and two-reach gear, and was trimmed in duck. The price of this type of vehicle with top was 60 dollars (£14). In painting no time is wasted, as in Australia, on lining. The only lining on a buggy of the style referred to is a sight line along the shafts, one along the reaches, and one on the face of the spokes.

A manufacturer of buggies actually manufactures as little as he can. He endeavors to buy the parts as complete as possible. All the men in the majority of buggy factories work piece-work. He was informed by a foreman in one factory that the smith earned about 5 dollars a day. Boys employed putting in tire bolts and drilling wheels were making from 2 to 3 dollars a day. Under these conditions employees try to do their best, and to show a good result for the turnover. To convey an idea of the extent to which specialization is carried on, it was pointed out to Mr. Yorston that the boy who put in the tire bolts did not screw on the nut. Each machine was worked by a separate electric motor which rendered belting unnecessary.

At Detroit, Mr. Yorston said he was unable to see any pleasure vehicles. The horse-drawn vehicle was completely off the street, except for a few milk wagons. The motor had taken their place. Gasoline was cheap. You could load up anywhere for 10 cents a gallon, and the very finest refined gasoline was obtainable in the city for this price. Nothing showed the wonderful development of the factory system in America more clearly than factories given over to the production of motor cars. At the Ford factory, over which Mr. Yorston was shown, they turned out a car a minute. The car being built moves along a tramway at six feet a minute. Gangs of men are placed at regular intervals and each man, having a certain set task, slips in and does it before the car moves on again. When it reaches the end of the track, two men take the car in hand. One man wires up, the other cranks the engine. It is lifted on to a platform, the hind wheel is dropped into a pair of shear blocks, and the brake is tested. The chassis is driven into a shed where an incline shoot releases the body. That completes the job. The car is then driven onto a railway truck.—Australian Coachbuilder and Wheelwright.

FORD COMPANY'S ANNUAL STATEMENT REVEALS TREMENDOUS PROFITS

The Ford Motor Co. during its fiscal year, which ended July 31, and extended over a period of only 10 months instead of 12, set aside the large surplus of \$59,135,770.66, an increase of \$10,308,738.59 over 1914, \$31,011,507.66 over 1913 and \$44,390,675.09 over 1912.

The cash on hand totaled \$43,788,151.23, while at the end of September, 1914, the total was only \$27,441,468.79, which means that in ten months the cash increased \$16,346,682.44. In 1913 the cash balance was \$13,225,710.82 and in 1912 it was \$6,400,100.66.

The total assets for the past year amount to \$88,535,840.41, an increase of \$26,903,583.25 over 1914. On the assumption that the fiscal year had been of twelve months instead of ten, the total assets might have reached the enormous sum of \$103,291,814.41 and the surplus might have totaled \$73,891,744.66.

The big item of \$15,000,000 listed under the liabilities is the buyers' profit-sharing reserve. This is in reality a part of the profits of the company, a part of the total surplus, which is being returned to the purchasers of Ford cars during the fiscal year because the company announced at the beginning of the fiscal year 1915 that if 300,000 cars were sold during the year the buyers of these cars would receive a rebate of from \$40 to \$60 per car.

It might be said that the 1915 surplus was actually \$74,135,770.66, but, after car No. 300,000 of the 1915 production had been sold, \$15,000,000 of the year's surplus was no longer to be considered as such, and became a liability.

Ford Motor Co.'s Annual Statement

Assets	
Cash on hand and in banks.....	\$43,788,151.23
Michigan municipal bonds at cost.....	1,311,924.10
Accounts receivable	2,300,456.42
Merchandise inventory at cost.....	14,335,767.87
Outside investments	9,200.00
Prepaid expenses	385,377.56
Real estate	3,148,263.01
Buildings and building fixtures.....	12,931,884.45
Factory equipment	2,606,356.06
Furniture and fixtures.....	328,497.30
Machinery and power plant.....	5,693,648.50
Tools	1,491,842.85
Patterns	142,998.22
Patents	61,472.84
	\$88,535,840.41
Liabilities	
Accounts payable, not due.....	\$4,947,805.81
Contract deposits	1,968,844.89
Accrued pay rolls.....	428,907.14
Accrued salaries	341,814.16
Accrued expenses	463,111.47
Contract rebates	1,281,661.01
Reserve buyers' profit sharing.....	15,000,000.00
Reserve for depreciation of fixed assets.....	2,855,188.94
Reserve for depreciation of patents.....	61,472.84
Fire insurance reserve.....	51,263.49
Surplus	59,135,770.66
Capital stock	2,000,000.00
	\$88,535,840.41

THIS LETTER DID IT

A recently arrived foreigner employed as a clerk by an implement dealer was asked by his employer to send out a polite dunning letter that would not be too pointed but would bring results. The results were phenomenal, every delinquent paying his account in full. The letter read as follows:

"Dear Mr.: If you do not do us the extreme honor of paying all the dollars and all the cents of this accounting, which so long you have owed to our business, we shall, to our regret, begin to do something that will cause you the utmost astonishment."

REAR WHEEL BRAKES A FEATURE OF SHELTON FIVE-TON AXLE

Model No. W-50 is the new five-ton ball-bearing worm-gear axle, announced as now ready for delivery, by the Sheldon Axle & Spring Co., of Wilkes-Barre, Pa. The new model has been through a thorough course of tests. It is designed and tested for an 18,000-pound tire load, including chassis, body and pay load. It is of the usual Sheldon semi-floating type axle, arranged for the largest possible capacity with low weight and few parts.

The use of ball bearings to take both radial and thrust loads, a feature of Sheldon practice, is carried out in the new design. A self-contained double-acting thrust bearing takes the thrust, while the radial load is taken by two single row annulars. The



Model W-5 Sheldon worm-gear axle for five-ton trucks

differential is mounted on single row annular bearings while the side thrust, differential and axle shaft are taken by separate thrust bearings. Either double row annular ball bearings or straight roller bearings may be used at the wheels.

Rear Wheel Brakes

Sheldon practice has also been followed in the construction of the brakes. As in all other Sheldon worm gears, this is done at the rear wheel rather than on the propeller shaft as the driving strain is taken through the springs thereby eliminating strut rods and torsion tubes. The track is $74\frac{1}{2}$ in. with maximum spring center distances of 49 in. with 4 in. springs. The housing and brake spiders are hydraulically pressed on nickel steel tubing and then riveted. The axle shafts are tapered to give a structure of uniform strength at all sections of the shaft. The shaft diameter is $3\frac{3}{4}$ in. at the outer bearing and the taper runs from the bearing collars to the differential. This provides the best possible distribution of the material while the material itself for the shaft is drop forged $3\frac{1}{2}$ per cent. chrome nickel steel heat treated to give it the designed physical properties.

For hardness, every driveshaft is given a Brinnell test before going to the machine shop, and any shaft not coming up to the proper standard is eliminated.

Double internal band brakes of what are known as the self-intensifying type are employed and are 3 in. in width and lined with Raybestos. They act on 24 in. cast steel drums, the bearing surface of which is machined to eliminate any high or wavy spots in the drums and thereby assure a perfect braking contact at all points.

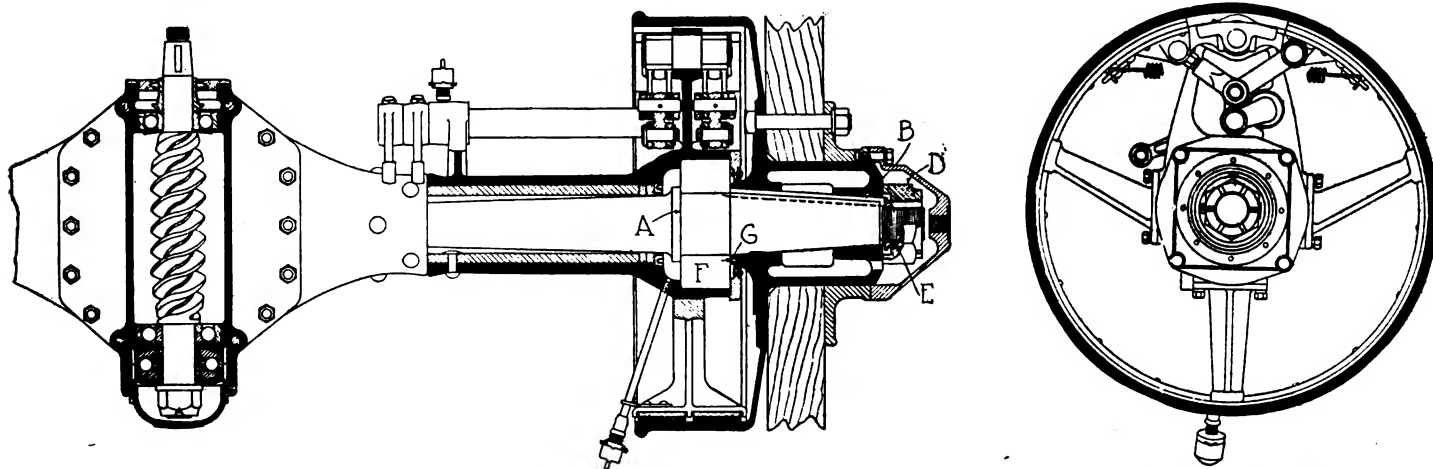
Steel against bronze, both metals being of the Sheldon private formulae are used for the worm and wheel. This part of the axle receives the most minute inspection as regards accuracy. Every individual worm and wheel being tested in a precision measuring machine to 0.0001 in. for accuracy. These tests are made so complete that absolute interchangeability of all worms and wheels is assured.

The axle housing ends are bell mouthed to resist distortion due to the hydraulic pressure when mounting the tube. Another safety precaution is in the flanging of the outer ends of the wheels where ribbing is placed to prevent damage in case the clutch is driven against the curb stone.

Bearings

A special feature which is noteworthy is in the construction of the wheel bearing housings which are made in box sections. Referring to the illustration, it will be noted that D and E are double nuts. The function of E is to take the key B against the bearing F and tighten it against the shoulder on the driveshaft A. This prevents the possibility of the bearing moving laterally on the driveshaft and producing a pounding action on rounding corners. The nut D is merely to tighten the hub on the conical part of the shaft. Both of these nuts are afterwards locked with cotter pins. The inside nut E which tightens the key is slotted and sometimes serves the purpose of a lock nut. This device eliminates any necessity for clearance between the bearing and hub as shown at G. This clearance is often allowed to permit the bearing F to float on the shaft. Repeated blows are apt to enlarge this clearance.

The W-50 model is also provided with a wheel puller attachment as indicated in the drawings herewith. The operation of demounting a wheel from this five-ton axle consists simply in removing the hub cap, taking off the wheel retaining nut, replacing the hub cap, and giving a few turns to the wheel removing stud which accompanies the axle. The axle ends are so designed that when the wheel has been removed, the bearings remain undisturbed and protected in their housing upon the axle shaft. Tie rods and ribs are eliminated entirely in Sheldon construction, this concern maintaining that from experience they are satisfied that if the tie rod is tight enough to perform any function it tends to buckle the axle and if it is loose enough so as not to endanger buckling it lets the axle down.



Structural plan and end views of the Sheldon overhead worm gear axle for five-ton commercial vehicles

TO ADVISE BUSINESS MEN IN EXPORT CAMPAIGN

A tour of the United States has been begun by the export-trade adviser of the Bureau of Foreign and Domestic Commerce, in an educational campaign conducted by the bureau, for the purpose of laying before the manufacturers, business men, and commercial organizations of the country practical and concrete information relative to the export business and extension of foreign trade.

It has been learned that many manufacturers who would like to enter these markets abroad, especially in Central and South America, have found obstacles in the lack of knowledge as to where there are specific opportunities, as to prevailing market conditions, business methods in the various countries, proper methods of making out the consular invoices, foreign customs regulations and trade-mark laws, shipping routes, and sources of credit information. The Bureau desires to place at the command of American manufacturers and exporters the great fund of practical information that has been collected through the medium of commercial attaches, consular officers, and commercial agents resident in foreign countries. These officials report the names and addresses of reliable firms which are in the market for American goods. Their statements on every phase of commercial life and activity in the countries to which they have been sent are made available through the Bureau.

The tour to be made by the export trade adviser, Special Agent Stanley H. Rose, will take him through New York state and the middle west, reaching Lincoln, Neb., in the middle of November. Among the places to be visited are New York City, Niagara, Buffalo, Rochester, Fairmont, W. Va., Indianapolis, Chicago, Kalamazoo, Jackson, Grand Rapids, and Detroit, Mich., Toledo, Springfield, and Columbus, O. The Bureau of Foreign and Domestic Commerce has received many letters from business firms, chambers of commerce, and other organizations throughout the United States, asking that their cities be included in the itinerary of Mr. Rose. An effort will be made to have him visit as many cities as possible before the end of the year.

The Bureau's special agent will have with him a traveling library containing the principal publications of value to the beginner in export trade, as well as statistics of imports and exports of the United States and the principal countries of the world. He expects to make his headquarters at the offices of the commercial organizations of the various cities that he visits. He will also assist in creating a wider acquaintance with the commercial clearing houses the Bureau has established in the leading commercial centers of the United States.

56 INCH TO BE STANDARD TREAD

At the meeting of the board of directors of the National Automobile Chamber of Commerce, Inc., held in New York City, it was decided to standardize the treads in motor vehicles at 56 in. after July 31, 1916. This will bring into line many vehicles which heretofore only varied from the given measurement by a fraction of an inch. A large majority of the cars now in use have the 56 in. tread.

The trade had been broadly canvassed with the idea of securing the viewpoints of the manufacturers and the result was that it was decided to drop the practice of making 60 in. tread for the southern trade. It was discovered that only in very few sections of the country were the roads in such a condition that the 56 in. tread offered any difficulty and the result was that they have all agreed to the 56 in. standard. One of the difficulties said to be in the way of the 60 in. tread is that the manufacturers concentrate their minds on the 56 in. standard with a result that orders for 60 in. tread are side-tracked until the factories are under less pressure.

BRITISH VANADIUM TIRE IS STRONG

In their endeavor to fulfill the enormous demand for strong, practically puncture-proof tires from the war authorities, British tire manufacturers are bringing out several novel types of tires, in which the puncture-resisting qualities are greatly enhanced. One of the latest is the "Vanadium" tire. This consists of an exceptionally well-built tire, with two extra layers of fabric and two layers of small disks of vanadium steel. The steel disks, of course, greatly increase the resistance of the tire to puncture on the road, while a new "curing" process employed by this company is claimed to strengthen the rubber itself. The vulcanizing process is completed in two-thirds of the time that had been possible before the invention of this method, and this reduction of the time of "curing" increases the tensile strength of the cotton fabric. When tires are cured too long, the fabric is impaired and its strength decreased. According to reports from Great Britain, this is a "British-built" tire, although American factories have been producing a very similar tire for some time past. The claim for "inventive thought" in this case may be merely imitation.

IMPERIAL WHEEL WORKS INCREASING CAPACITY

Plant extensions now under way at the Imperial Wheel Works, Flint, Mich., and expected to be completed not later than the first of the year, will make possible an increase of at least 50 per cent. in the production capacity of that plant, according to an announcement made by General Manager C. E. Bonbright. The capacity of the dry kiln has been doubled and the plant is already setting new production records as a result. The main factory building is now being enlarged by an addition 15 feet wide and running the whole length of the present structure, along the front, making use of every foot of ground to the street line for the building. While this will increase the size of the main building less than one-fourth it will make possible a much larger capacity in proportion, for the question of space is the greatest factor in the kiln rather than in the main plant.

The increased business of the concern, due almost entirely to the increased business of local automobile manufacturers, has made these expansions necessary.

ARGO MOTOR CO. BUYS STANDARD ELECTRIC PLANT

A deal has been completed whereby the Argo Motor Co. has acquired the plant and land of the old Standard Electric Co., at Jackson, Mich., which it has been occupying. It is expected that arrangements will be made to enlarge the manufacturing facilities of the company, it being contemplated to build between 20,000 and 30,000 Argo cars for the season of 1916.

In connection with the contemplated expansion move it is announced that the Jackson Motor Parts Co. has been organized and incorporated. Its capital stock is \$210,000. This concern will make principally parts for the Argo cars, but, it is said, will ultimately also make parts for the general trade. L. E. Latta, vice-president and general manager of the Argo company, has been appointed president and general manager of the new parts company. L. E. Wilson, Chicago, is now managing the Argo business, and Stanley Whitwarth, Indianapolis, has become production manager.

FILES BANKRUPTCY PETITION

In the United States Court a voluntary petition in bankruptcy has been filed by Richard Jurney, of Waco, dealer in buggies, wagons and farm implements. His liabilities are \$17,410, his assets being \$21,381. Exemptions are \$7,550.

WICHITA CARRIAGE WORKS TO PUT UP ADDITION

The Wichita (Kas.) Carriage Works, of which Mrs. M. A. McKenzie and sons, Leo and Donald are the proprietors, will erect a new brick building, 50x75 feet and two stories high. It will face on First street and will be just west of the old building which the company has occupied so long. To make room for it, some additions in the rear of the original building will be torn down.

The new building will be used for the finer class of carriage and automobile work. The second floor will be fitted up for painting and finishing rooms. An elevator will be placed in the building for the purpose of raising and lowering vehicles. In addition to the new building, the company is putting in new floors and making some other repairs in the south part of the old building. This will be used by the woodworking department.

TRACTION LINES OPERATE BUSES

In view of the strong favor of the Baltimore public for motor buses, which is shown by its patronage of a bus line operated on Charles street by the Paye company, the United Railways and Electric Co. has organized a bus operating company known as the Baltimore Transit Co., and has established a service over the same route.

Twenty-five one-ton Garford chassis have been purchased and these have been equipped with bus bodies built by the J. G. Brill Co., of Philadelphia. The purpose of the company is to fight competition of the independent bus lines. The purchase of so large a number of buses indicates the belief that buses have become a permanent means of transportation in the city.

PLAN 600 PER CENT. STOCK DIVIDEND OF CANADIAN FORD CO.

Distribution of a 600 per cent. stock dividend to shareholders of the Ford Motor Co. of Canada, equivalent, at the present price of the stock, to \$18,000,000, was recommended by the company's stockholders at their annual meeting October 25, in the general offices of the company at Walkerville, Ont.

This action closely follows payment of a 50 per cent. cash dividend, which was made by the company to its stockholders within the two weeks previous.

The mammoth stock dividend is recommended as part of the plan approved by the stockholders for increasing the company's capital stock from \$1,000,000 to \$10,000,000. The plan contemplates the issue of \$6,000,000 par value of new stock to the present shareholders, for which capital account will be compensated by the transfer of \$6,000,000 from the company's surplus fund to capital stock.

ATTENDING TO BUSINESS AT 91

"Father" George Yule, pioneer of Kenosha, Wis., celebrated his 91st birthday there August 31.

Mr. Yule is president of the Bain Wagon Co. and was among the first of the officials of the company to appear at the office on his birthday. Regardless of his 91 years he was busy the entire morning attending to business.

In the afternoon he quit work long enough to attend a reception in his honor at the home of George A. Yule, his son.

He declares he finds the real fountain of youth in hard work.

Mr. Yule is in excellent health and seldom misses a day from his office.

RANDOLPH BUILDS TRAILERS

The Randolph trailer is made by H. C. Randolph, successor to the Standard Auto Trailer Truck Co., Jonesville, Mich. It

sells for \$45 and upwards, according to load capacity, steel or rubber tires and the kind of axle.

There is only one model G, but it is made in four different sizes as far as loading capacity is concerned. The trailer with a 1,000 lbs. capacity has 1½ in. steel or rubber tires; the one with a capacity of 1,300 lbs. has 1¾ in. steel or rubber tires; with a load capacity of 1,600 lbs. the tires are 1¾ in. steel or rubber, and they are 1½ in. rubber or steel for the trailer carrying 2,500 lbs. There are two series, the first one having a D. C. axle and the second series a Timken.

HOUGHTON SULKY CO. TO BUILD TRUCKS

The Houghton Sulky Co., Marion, O., will shortly start the building of one-ton trucks, which will be designed principally for delivery purposes, and which will be known as the Houghton. The first of these trucks will be on the market about the first of the year. L. R. Wottering is the engineer in charge of the designing department. The truck will be equipped with a four-cylinder engine developing 22 h.p. It will have three speeds forward, and the rear axles will be an improved floating type, and will be especially constructed to take care of overloads. The wheel base will be longer than most light trucks. All parts of the truck will be standardized. The retail price has not been fixed.

ALMA TRUCK PLANT BUILDING NEW ADDITION

The Republic Motor Truck Co., of Alma, Mich., has broken ground for the third new building within a month, the latest addition to the plant to be nearly twice as large as the two new additions recently started. The new structure is to have 35,000 square feet of floor space, which with the 19,500 square feet in the two other structures now building and the main plant will make it the largest factory in the state outside of Detroit and Grand Rapids. The building will be of brick, one story in height and will cost \$20,000. It will be built in the shape of the letter U.

JACKSON TRAILERS IN THREE TYPES

The Jackson automobile trailer is the latest product of the Miles Mfg. Co., of Jackson, Mich. The trailers are made for use by any kind of automobile. There are three different types, each with several models.

Where delivery body is ordered 1½ in. rubber tires are furnished, while on trailers with rack style body, models 31 and 33, 1¾ in. tires are fitted. On model 41, 1¾ in. rubber tires are used. All models have a universal joint coupling. The standard color is Brewster green. The prices range from \$22 to \$98, f. o. b. Jackson.

HENNEY BUGGY CO. WILL BUILD BODIES

The Henney Buggy Co., Freeport, Ill., will hereafter devote its plant largely to the manufacture of bodies for commercial trucks to be attached to Ford chassis. After a series of experiments, the plant has turned out a line of models to suit various industries, ranging from the small package box or open body that can be fastened at the back of the seat on the Ford runabout, to the large steel paneled-inclosed body that is used largely by clothing, dry goods, and laundry firms, the bodies ranging in price from \$18 to \$100, according to the requirements of the trade.

BIG ORDER FOR INTERNATIONAL TRUCKS

The International Motor Co. has closed an order for 700 five-ton trucks for the Russian government. Most of these will be made at the Plainfield, N. J., plant.

PERLMAN WINS PATENT SUIT

Louis H. Perlman, after fighting for seven years to get a patent on demountable rims through the United States Patent Office, has won a suit in the United States Court against the Standard Welding Co., of Cleveland, and has secured an injunction against the company and a share in the profits from all its previous production. It is probable that the case will be carried to the United States Supreme Court by the defendants. Mr. Perlman announced that if he finally succeeds he intends merely to demand a satisfactory royalty for the use of the idea. He will not prevent anyone from using it who is willing to meet his terms.

HAYES MOTOR TRUCK WHEEL CO. ORGANIZED

The Hayes Motor Truck Wheel Co. has been organized in St. Johns, Mich., with a capital of \$100,000. Officers have been elected as follows: President, C. B. Hayes; first vice-president, N. S. Potter; second vice-president and timber manager, W. C. Morrey; secretary-treasurer and general manager, A. D. Smith, and superintendent, H. J. Keller. The company, which is occupying the factory of the St. Johns Mfg. Co., expects to be in operation by November 1, and a sawmill will be opened in conjunction with the plant.

MEETING OF ST. LOUIS ASSOCIATION

The October meeting of the St. Louis Wagon, Carriage and Auto Body Builders' Association was held Tuesday evening, the 26th, at the American Annex. John Cook, president of the association, was in the chair. This was the first meeting after the summer recess and was largely attended. David Keck, chairman of the entertainment committee, reported arrangements for an entertainment and dance to be given by the association on December 18 at Eagles' Hall, Jefferson and Lafayette avenues. A story-telling contest was held, George Nickamp, of Beck & Corbett Iron Co., being awarded the prize, a box of cigars.

WOULD DISSOLVE CONANT COMPANY

Application for an order dissolving the Conant Carriage Woodwork Co. has been filed in the Common Pleas Court in Cincinnati, by Edwin W. Conant, holder of 196 of the 200 shares of stock of the concern. Conant says that the company has practically discontinued and abandoned its purposes. The company has \$1,593.77 in accounts owing to it, and owes \$5,700 upon a note given to the Atlas National Bank and dated September 4, 1914. No other assets save the accounts mentioned are owned by the concern. Attorney C. P. Mackelfresh represents Conant.

GRAY-DORT CO. TO MAKE CARS IN CANADA

Capitalized at \$500,000 of which \$300,000 is paid up, the Gray-Dort Automobile Co. has been organized at Chatham, Ont., to make the Canadian Dort cars.

Robert Gray, of the Gray-Campbell Co., and J. D. Dort, who has been president of the Dort Motor Car Co., Flint, Mich., are the heads of the new company. F. Knight will be superintendent. Frank Averill has also gone to Chatham from Flint to join the new organization.

STUDEBAKER HEADS NEW TIRE COMPANY

Peter E. Studebaker, son of the late Henry Studebaker, one of the founders of the Studebaker Corporation, will be president of the International India Rubber Tire Co., a \$1,000,000 corporation organized in South Bend. The officers of the company are: E. H. Schwab, Bethlehem, Pa., vice-president;

G. W. Odell, Findlay, O., secretary; J. R. Noble, treasurer. These men, with William S. Moore, city engineer of Grand Rapids, Mich., form the board of directors. Neither the Studebaker Corporation, nor any of its officials are interested financially or commercially in the proposition.

KENTUCKY CONCERN GETS BIG WAGON CONTRACT

The Kentucky Wagon Mfg. Co. has just been awarded a government contract for the manufacture of wagons for the United States army to cost close to \$50,000. Work on the order has been started and it is planned to make delivery within three or four months. The number of wagons to be manufactured in Louisville is not given. The wagon company had just completed a \$35,000 order for army wagons.

PAUL SMITH ELECTED A VICE-PRESIDENT OF CHALMERS COMPANY

At the regular meeting of the board of directors of the Chalmers Motor Co., Paul Smith was elected one of the vice-presidents of the company. He is vice-president in charge of the sales, service and advertising departments. Mr. Smith will fill the position held by Lee Olwell, who recently resigned from the Chalmers company.

KELLY MOTOR TRUCK CO. CHANGES NAME

Owing to a confusion in the names of the Kelly-Springfield Motor Truck Co., and the Kelly Motor Truck Co., Springfield, O., the latter company has changed its name to the Sunset Motor Truck Co. There is absolutely no change in the name or policy of the Kelly-Springfield Motor Truck Co., and the manufacture of Kelly trucks will go on as heretofore.

KELLY-SPRINGFIELD TIRE CO. EARNINGS

Kelly-Springfield Tire Co., for the first half of 1915, earned in excess of \$700,000, compared with net earnings of \$1,215,144 for full year 1914. The directors say that \$1,500,000 is a conservative estimate of net earnings for the full year. Allowing for bond interest and preferred dividends, this will leave approximately 25 per cent. for common stock.

CAN'T AGREE ON TIME FOR MODEL ANNOUNCEMENTS

At a recent meeting held by the representatives of the various firms of the National Automobile Chamber of Commerce, it was decided that it is almost impossible to settle upon any definite time for the announcement of new models, owing to the diversified opinion of the various manufacturers represented.

WOULD LOCATE IN TOLEDO

The Monroe Automobile Co., of Flint, Mich., a two-year-old concern employing 800 men, wants to remove to Toledo.

Frank Monroe, president of the company, says: "We are figuring on moving to Toledo. The city's location and its splendid transportation facilities make the change desirable."

WILL LOCATE NEAR ROCHESTER

Crowther Motor Co., of Philadelphia, is planning the establishment of a plant in the town of Greece, near Rochester, N. Y., in which will be manufactured motor vehicles to sell for between \$300 and \$400. A truck will also be manufactured, which will embody a number of new features developed by Charles E. Duryea.

Trade News From Near and Far

BUSINESS CHANGES

Charles Warning has purchased the late James Cuthbertson's wagon shop at Glidden, Ia.

G. A. Laxon has purchased the implement and vehicle business of J. A. & L. L. Ritchie, of Sturgeon, Mo.

Albert Miller, 15 years in charge of the woodwork department of the Fred P. Neumeister carriage repair shop in Rockport, Ill., has purchased the shop of John A. Atkinson in that city and will embark in business for himself.

The J. S. Morris Carriage Co., a corporation of Waupin, Wis., has been dissolved. Mr. Morris has purchased the stock and the business will be conducted in the future under the firm name of J. S. Morris Carriage Manufacturer.

NEW FIRMS AND INCORPORATIONS

The Moore Buggy & Harness Co., Lebanon, Tenn., have just opened new in the buggy, harness and implement business at that place.

The Lewis Hardware Co. has engaged in business at Tecumseh, Okla., for the purpose of handling implements, hardware, wagons, buggies, washing machines, etc.

Acme Motor Truck Co. has been incorporated at Detroit, Mich., with capital of \$50,000. Incorporators, J. George Wagner, H. A. Cooney and Albert E. Cooney.

The Standard Top Co., Kingston, Pa., has been incorporated with a capital stock of \$12,000 by George G. Stillman, 90 Chester street; Merton L. Davey, L. Scott Dale, 86 Chester street, Kingston, and Joseph M. Stark, Hudson, Pa., to manufacture automobile tops.

A new firm to be incorporated as the Ideal Wheel Co. will be established in Massillon, O., for the manufacture of steel wheels for automobiles and motorcycles. Arnold Markel, Cincinnati, will be general manager. It will occupy a building at the plant of the Everhard Co.

The Fulton-Walker Co., Twentieth and Filbert streets, Philadelphia, has been incorporated with a capital of \$15,000 by J. N. Chamberlain, Ninth and Chestnut streets, Philadelphia; Edmund S. Mills, Fort Washington, Pa.; Russell Shepherd, 913 South 59th street, Philadelphia, to manufacture wagons, automobiles, trucks, etc.

Articles of incorporation have been issued to the Rochester Trailer Co., East Rochester, N. Y., with a capital stock of \$25,000, to manufacture automobiles, trucks, trailers, hearses, etc. K. Gleason, Pittsford, N. Y.; C. H. Babcock, 22 Berkeley street, Rochester, and E. E. Keller, 720 Jefferson avenue, Detroit, Mich., are the incorporators.

FIRES

The Hoquiam Wagon Works, Aberdeen, S. D., sustained \$150 fire damage on November 2.

The big six-story automobile and carriage factory of the Chauncey Thomas Co., at Boston, Mass., was destroyed by fire on October 30.

NEWS OF THE TRADE

The Lowell (Mich.) Cutter Co. will make auto trailers.

The Auto Car Co., Ardmore, Pa., has increased its capital stock from \$1,000,000 to \$2,000,000.

The Robinson-McGill Carriage Co., at Nashville, Tenn., has increased its capital from \$50,000 to \$200,000.

The Lowell Cutter Co., Lowell, Mich., has added the manufacture of automobile trailers to its activities.

The Haynes Automobile Co., Kokomo, Ind., is arranging for the erection of an additional plant to cost about \$250,000.

The C. E. Elsey Carriage Co., of Springfield, Mo., reports business for the past year as being the best in its history.

The Fisher Vehicle Wood Stock & Lumber Co., Erin, Ark., will install equipment for a vehicle woodstock plant at Little Rock, Ark.

It is reported that the Wichita Falls Motor Co., manufacturers of automobiles, will move its plant to Dallas in the immediate future.

The capital stock of the Victor Rubber Co., has been increased from \$150,000 to \$400,000 to allow for improvements and additional equipment.

The Maxwell Motor Car Co., Dayton, O., is having plans prepared for doubling the capacity of its body building plant. Woodworking and other equipment will be required.

Union Automobile Co., Auburn, Ind., capitalized at \$100,000, has been formed to manufacture automobiles. The directors are: C. M. Brown, John Zimmerman and W. H. Schaab.

Two large factory buildings are being erected at Ovid, Mich., by the Wixon & Bensinger Handle Co., which will manufacture axe handles and wooden wagon parts. About 25 men will be employed.

The Richard Automobile Mfg. Co., Cleveland, O., expects to start work shortly on its new plant on Finney road, near East 80th street. The first building will be 110 x 193 feet, of steel and brick.

The Jenkins Vulcan Spring Co., St. Louis, Mo., has been incorporated with a capital stock of \$40,000 by T. B. Jenkins, R. G. Zetrouer, J. F. Jenkins and others to manufacture motor vehicle springs, etc.

The Auto Wheel Co., Lansing, Mich., has begun the erection of a one-story addition, 54 x 160 feet, to house its hub department. The building with its equipment will represent an investment of \$20,000.

Since the Blount Carriage & Buggy Co., Atlanta, Ga., recently established its automobile paint and top repairing department, it has found itself in the midst of a splendid season of business in this line.

F. E. Lotz Co., manufacturer of auto bodies, 1627 Michigan avenue, Chicago, Ill., also known as the Chicago Auto Body Co., has filed a voluntary petition in bankruptcy. Liabilities, \$3,799.24; assets, \$496.36.

The Hess Spring & Axle Co., Carthage, Cincinnati, is rushing work on an addition to its plant to be approximately 150 x 200 feet, of brick, steel and concrete. It will give the company over 45,000 sq. ft. of floor space.

Contracts have been let by the Chalmers Motor Co., Detroit, for the construction of an addition to its plant, 60 x 200 feet,

four stories. The building will contain an extension of the machine shop and stock room and will allow for an increase in the company's output.

The roof is being put on the new factory building of the Michigan Hearse & Motor Co., at Grand Rapids, Mich., and in a short time that addition to the plant will be in use. The company will spend about \$20,000 for new building and several thousand more for equipment. A doubled capacity for the company will result from the improvements.

The Studebaker Corporation, South Bend, Ind., will erect a four-story building at Long Island City, N. Y., 80 x 160 feet, for use as a service station and also for tuning up the cars shipped from the Detroit factory. A repair department will be maintained in connection with the service station and the whole building is expected to be ready December 1.

The Chevrolet Motor Co., 816 Eleventh avenue, New York City, has purchased the northeast corner of Eleventh avenue and 55th street, New York, containing a site 25 x 100 feet, and has leased 15 surrounding lots constituting the entire block on Eleventh avenue from 55th to 56th streets with a frontage of 200 feet on both streets. The property has been acquired in connection with the New York City service station for the company.

A DISTINCTIVE AUTO TRAILER

The Warner auto trailer, built at Beloit, Wis., is expected to revolutionize the trailer industry. It is built to form an integral part of the auto to which it is attached. It is not a wagon, but is constructed along the lines of good automobile engineering practice. The frame is built of channel steel, the wheels of second growth hickory with 30 x 3 standard pneumatic tires. The body is built of fir and the axle of chrome vanadium steel.

One of the features of the trailer is the manner in which it is attached to the automobile ahead. This method of attachment is known as the Warner "hitch." It can be attached or "unhitched" in a second and the balance is arranged so that no matter how great the load on the trailer very little weight or strain comes on the hitch. The company backing the enterprise comprises A. P. Warner, Ben Cadman and James Menhall.

STUDEBAKER TO SELL TREASURY STOCK

The Studebaker Corporation will offer to its stockholders of record November 20 the right to subscribe to 20,680 common shares, now held in the treasury, at 110. Subscription will be in the amount of 7 per cent. of the shareholders' total common. On the basis of the market October 27, the rights were figured to be worth 9¼. The announcement of President Erskins said:

"Out of the proceeds from the sale of the common stock the company will retire on the next interest date all outstanding serial notes amounting to \$2,300,000, the last of which would in the ordinary course of events not be due until 1922. After retirement of these outstanding serial notes the corporation will be free of all debts, save the current accounts, and will have \$22,500,000 working capital, of which \$6,500,000 is cash."

Under the company's charter no dividend in excess of 6 per cent. can be paid until a special reserve fund of \$2,500,000 has been set aside for the retirement of the preferred stock. This segregation is nearly completed.

McLAUGHLIN WILL ASSEMBLE CHEVROLET CARS IN CANADA

The McLaughlin Carriage Works, Oshawa, Canada, have completed arrangements with the Chevrolet Motor Co. of Delaware, whereby their big carriage plant in Oshawa will be turned into

an assembling plant for Chevrolet cars. At the same time the McLaughlin concern takes charge of the Chevrolet Motor Co. of Canada, recently formed to operate a plant in West Toronto. Thus the Chevrolet business in Canada will be controlled entirely by the McLaughlins.

Through the new arrangement it will now be possible to increase the production of Chevrolet cars in Canada from 5,000 to 12,000 for the season of 1916. An output of 20,000 has been planned for 1917, it is said.

The McLaughlins have a controlling interest in the McLaughlin Motor Car Co., Ltd., which assembles and sells the Canadian Buick, the General Motors Co. having the balance of the stock.

VETERAN COACH BUILDER IS GIVEN COMPLIMENTARY CELEBRATION

A unique event in the history of the carriage trade of Australia took place in September, the occasion being the 81st birthday of Mr. Dan White, who has been associated with the trade upwards of 50 years.

A complimentary social was tendered Mr. White by members of the trade, at which numerous congratulatory speeches were made. Mr. White was one of the pioneers of the Master Carriage Builders' Association. He had been connected with many movements, and he had lived long enough to see the establishment in Victoria of his own trade, and of which he has been the leader during the whole time he has been in business.

A handsome illuminated address was presented to Mr. White by Wm. Burton, chairman of the gathering, in behalf of the members of the trade throughout Victoria.

IMPROVEMENTS AT ST. MARYS WHEEL AND SPOKE WORKS

One new building is finished; another with the walls up at the St. Marys (O.) Wheel and Spoke Works plant. The completed building is intended as a storage place for a stock of iron wheel flanges usually amounting to about 200 tons. The structure is situated north of the office, extending east for a distance of 90 feet. It is a frame building, 50 feet in width and one story high. The floor is laid and the walls are up for a modern, compartment, all concrete dry kiln with ground dimensions of 26 x 90. The unit extends east and west alongside dry kiln No. 7.

NEW TRUCK COMPANY AT CADILLAC

Business men of Cadillac, Mich., who have been successful in other lines are to undertake the manufacture of a motor truck. The company will be known as the Cadillac Auto Truck Co. The president is Walter Kysor, president and general manager of the Cadillac Machine Co.; John P. Wilcox, a lumberman, is vice-president, and C. J. Helm, manager, is chief owner of the Cadillac Brick Machine Co.

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TRADE NEWS PUBLISHING CO.

G. A. Tanner, Sec'y and Treas.
Sworn to and subscribed before me this 6th day of October, 1915.

JOSEPH R. FRITH,
Notary Public Kings County. Certificate filed in N. Y. County.
(My commission expires March 30, 1916.)

OBITUARY

Charles Levi Carlton, of Le Roy, N. Y., died October 24 at a Rochester hospital, where he was taken for treatment about six months ago. Mr. Carlton was born in Oldtown, Me., on May 7, 1833, and moved to New York state when 11 years old. About 52 years ago he located in Le Roy where he was engaged in the wagon and carriage building trade, working at his trade up to about ten years ago. His only immediate survivors are a daughter and one sister.

William J. Davis, 49, assistant secretary and general manager of the D. M. Sechler Implement and Carriage Co., of Moline, Ill., passed away on Saturday, October 30. Mr. Davis was a pioneer in the development of one of Moline's greatest manufacturing industries. Twenty-seven years ago he went to that city to enter the employ of the D. M. Sechler Co. in the shops. He advanced rapidly and for the last eight years has held the position of assistant secretary. His health failed during the early part of the summer and since that time he had been under medical attention. The decease measured to the standard in all that the word manhood implies. He gave loyally of his ability to the Sechler company and found time also to work for advancement of the city's interests. He was a member of the Board of Education at the time of his death. Mr. Davis was born in Richland Center, Wis., and was one of a family of six sons. He grew to manhood in the town of his birth, then spent a few years on a ranch in Kansas before going to Moline. One son, now 11 years old, besides the widow, survives him.

B. A. Gibson, 55, well known vehicle salesman who made headquarters at Williamsport, Pa., is dead. Deceased had been in failing health for a year, and the cause of death was Bright's disease. For many years he was with the Youngstown Carriage Co., remaining their representative until they gave up the manufacture of vehicles, when he engaged with Sturtevant Larrabee Company, of Binghamton, N. Y. He is survived by a widow.

Clarence Lowell, 63, well known carriage manufacturer of New Bedford, Mass., passed away suddenly on October 12, at Foxborough, Mass., of apoplexy. Mr. Lowell was a native of Amesbury where he learned the carriage making trade. He is survived by his widow.

Henry P. Miller, 81, formerly a member of the firm of Miller & Ahlbrand, carriage manufacturers, Seymour, Ind., died at his home in that city on October 5, of heart disease. Mr. Miller was a member of the city council of that city for years. He is survived by a son, Charles Miller, of that city, and a daughter, Dr. Luella Schenck, of Indianapolis.

Charles Sharp, 74, a retired wagon maker of Perry, Mich., and for 30 years a resident of that place, passed away October 27 from apoplexy. He is survived by his widow and two children. He had been for a long time a prominent business man of Perry.

LEMOINE DIES IN PARIS

M. Louis Antoine Lemoine died recently in Paris, France, at the age of 62. He was the head of the automobile spring company bearing his name and was also president of the French Society of Makers of Motor Parts and Accessories.

NOW IN NEW PLANT

The new plant of the Brighton Pole & Shaft Co. at 3001 Spring Grove avenue, Cincinnati, O., is being occupied now and gives the company facilities for supplying the increased demand for poles and shafts, both painted and in the white. Clarence Rossiter is manager of sales.

WANTS

Help and situation wanted advertisements, 1 cent a word; all other advertisements in this department, 5 cents a word; initials and figures count as words. Minimum price, 30 cents for each advertisement.

PATENTS

Patents—H. W. T. Jenner, patent attorney and mechanical expert, 606 F St., Washington, D. C. Established 1883. I make a free examination and report if a patent can be had and exactly what it will cost. Send for circular.

HELP WANTED

Wanted—Capable man who understands the manufacture of wooden automobile wheels, who could take full charge and produce results. One who could take an interest in the business preferred. Address Box 25, The Hub, Elm and Duane streets, New York City.

AUSTRALIAN CARRIAGE BUILDER DIES

Mr. C. Harling, veteran member of the carriage trade of Australia, died at Mayborough, Victoria, on August 16.

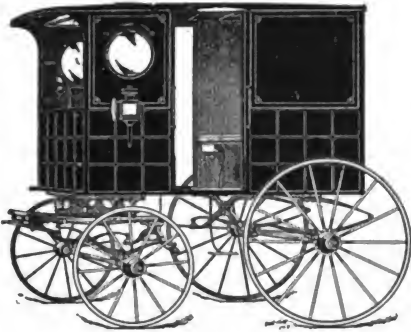
Mr. Harling was one of that large company of old country carriage builders whose coming to Australia in the early gold digging days made possible the development of the industry on sound lines. He was identified with the coach building trade of the Mayborough district since shortly after his arrival in the colony in 1854.

In 1870 Mr. Harling started the present business in Maryborough, and it soon grew, under his management, until it became one of the largest and most complete shops of Melbourne. At one period over 30 hands were kept constantly employed.

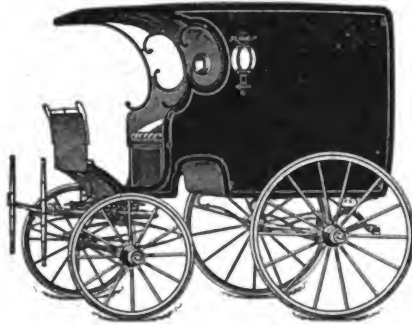
Mr. Harling leaves a family of five married daughters, and two sons, the eldest, Fred Harling, having succeeded his father in the control of the business.

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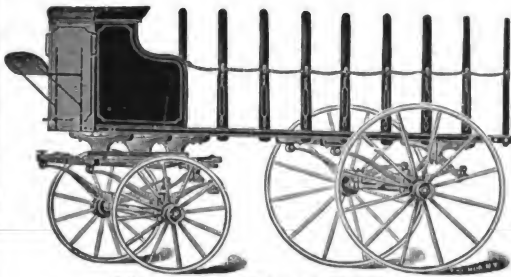
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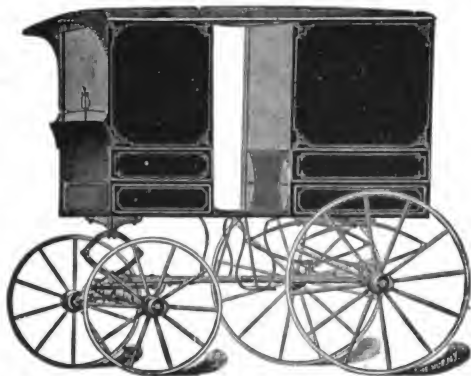
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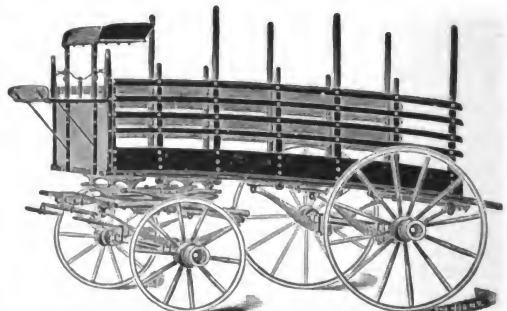
No. 116.—Milk Wagon.



No. 114.—Delivery Wagon.



No. 124.—Delivery Wagon.



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No. 118.—Ambulance.

Electrotypes

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The American Harness and Saddlery Directory

The 1915 Edition

An extra painstaking revision of the names (and other information as below) constituting the Retail Harness Trade, has been completed for this year's issue of the Directory, and we think the work is so important and worthy that the

1915 Price Is \$5 Per Copy

and it is very moderate for what is offered in a work that is

Indispensable for Reference

for copying of addresses, and for all purposes usual in a directory.

Just a Sketch of Its Contents

The list of the **WHOLESALE** and **JOBGING TRADE** is so arranged as to make it convenient to separate the association members from those not so recognized.

The **RETAIL HARNESS MAKERS** of the United States and Canada comprise the principal part of the Directory, arranged by State, Town and County, and in the large cities, the street and number is given. Those rating (approximately) over \$1,000 are marked.

A list of **HARNESS DEALERS** as distinguished from retail harness manufacturers, is also given. The value of this list to those who solicit the vehicle, implement, hardware and department stores will be readily appreciated.

A list is also published of Export Commission Merchants, giving the class of merchandise they handle.

PUBLISHED BY

THE TRADE NEWS PUBLISHING COMPANY

PUBLISHERS OF "HARNESS"

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"One," Says Nature; "Three," Says Cunning

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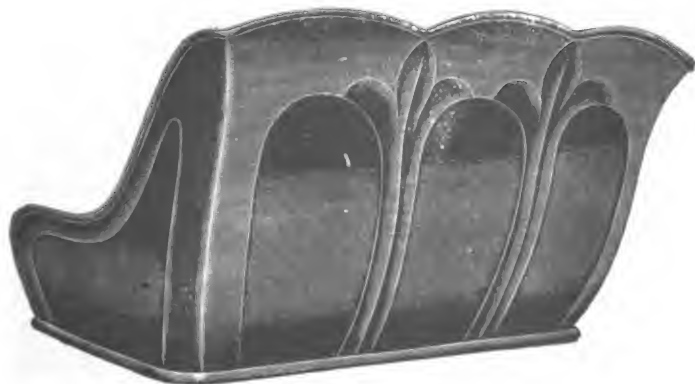
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The Best Leather Substitute

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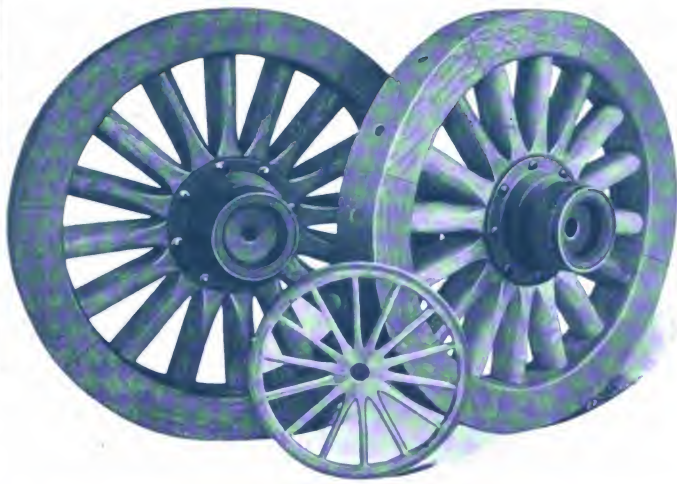
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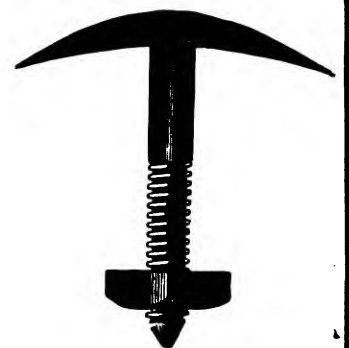
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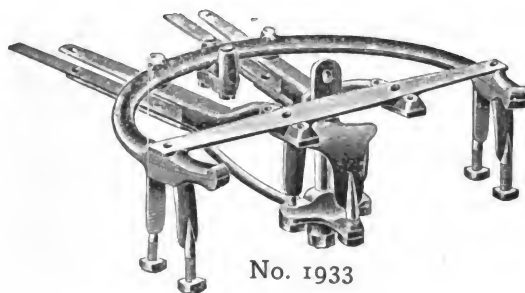
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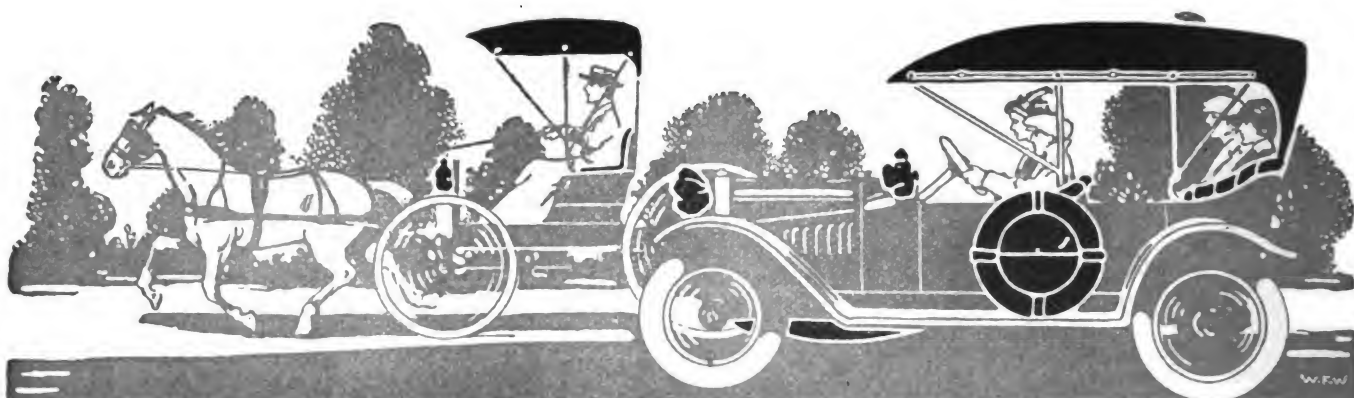
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NOW

The Standard Oil Cloth Co., Inc.

320 Broadway, New York

The Hub

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Entered in the New York Post Office as Second-class Matter

Vol. LVII

DECEMBER, 1915

No. 9

THE TRADE NEWS PUBLISHING CO. OF N. Y. Publishers of THE HUB

J. H. WRIGHT, President

G. A. TANNER, Secretary and Treasurer

EDISON BUILDING, COR. ELM AND DUANE STS., NEW YORK

Other Publications of Trade News Publishing Co.:

HARNESS (monthly).....per year, \$1.00
AMERICAN HARNESS AND SADDLERY
DIRECTORY (annual).....per copy, \$5.00

THE HUB is published monthly in the interest of employers and workmen connected with the manufacture of Carriages, Wagons, Sleighs, Automobiles and the Accessory trades, and also in the interest of Dealers.

Subscription price for the United States, Mexico, Cuba, Porto Rico, Guam the Philippines, and the Hawaiian Islands, \$3.00, Canada, \$2.50, payable strictly in advance. Single copies, 25 cents. Remittances at risk of subscriber, unless by registered letter, or by draft, check, express or post-office order, payable to the order of THE TRADE NEWS PUBLISHING CO.

For advertising rates, apply to the Publishers. Advertisements must be acceptable in every respect. Copy for new advertisements must be received by the 25th of the preceding month, and requests to alter or discontinue advertisements must be received before the 12th day of the preceding month to insure attention in the following number. All communications must be accompanied by the full name and address of writer.

FOREIGN REPRESENTATIVES:

FRANCE—L. Dupont, publisher of *Le Guide des Carrossiers*, 78 Rue Boissiere, Paris. Subscription price, 15 francs, postpaid.

GERMANY—Gustave Miesen, Bohn a Rh. Subscription price, 12 marks, postpaid.

ENGLAND—Thomas Mattison, "Floriana," Hillside avenue, Bitterne Park Southampton. Subscription price, 12 shillings, postpaid.

Entered in the New York Post Office as Second-class Matter

Interesting Comparisons

An interesting comparison of the relative costs of three types of vehicles, used in all-city haulage, is presented in this issue of The Hub, in the account of the four-years' study of the city haulage problem by Mr. H. F. Thompson, of the Massachusetts Institute of Technology.

Mr. Thompson treats the various subjects of conditions, costs and results, with much detail, and the sum of his findings tends to establish the fact that for all haulage beyond a two-mile limit the horse must give first place to the gasoline and electric types of trucks.

We are moved to comment on the conclusions drawn by Mr. Thompson to this extent: He has not given us for a fact the average distance traveled by trucks handling strictly all-city haulage business.

Taking our own city of New York as an instance, we are inclined to the belief that the bulk of such haulage comes pretty near to being within the two-mile limit. The inference to be drawn is very plain.

The central mercantile district of New York comprises

a territory within a comparatively short radius of the principal transportation depots, both receiving and dispatching, and within this district is found the greatest congestion of traffic in connection with the transportation of merchandise, both in bulk and otherwise. A visit to either of our river fronts shows the motor truck conspicuous by its absence. As a matter of passing, though pertinent interest, the editor can now look out upon Duane street, for the distance of several blocks, and there is not a motor-driven vehicle in sight. This condition exists practically all day long, and the curb is lined with horse-drawn trucks, loading and unloading. This street is typical of the district referred to.

Duane street is included within the mercantile district before mentioned, which district no doubt furnishes the largest portion of our city haulage traffic.

A large part of this hauling is done by individual truck owners, with offices located in the different mercantile houses, who handle the business on a tonnage basis. These men are from Missouri—they have to be shown—and when the motor-driven vehicle attains that state of perfection where it can demonstrate its ability to save them money, it will be only a matter of a comparatively short time when the substitution for horse-drawn trucks will take place.

These observations tend to show that while the motor-driven truck is most efficient for distances outside the two-mile limit, it may also be admitted that in perhaps a majority of cases the bulk of strictly city haulage comes within that limit. These observations are given, not as an argument for the horse, for The Hub is entirely non-partisan, being first for the vehicle industry, whether horse-drawn or motor-driven, but merely as evidence of conditions which seem to exist in this city.

National Prosperity

During the twelve months ending with October, the foreign trade of the United States exceeded \$5,000,000,000. Imports were \$1,691,748,013 and exports \$3,318,634,636, as compared with imports of \$1,880,414,501 and exports of \$2,140,847,829 during the same twelve months previous.

The movement of merchandise and gold shown in figures recently made public by the Department of Commerce evidences how decidedly the United States has been converted from a debtor to a creditor nation.

Exports of October established a new high record, rising to \$334,638,578, which was \$33,961,756 more than the former record made in September. October imports were \$148,529,620. The record trade balance made during

the month was \$186,108,958. The previous high balance, made in February, was \$174,600,000.

During the twelve months ending with October \$326,528,779 in gold came to the United States to pay the debts of other nations.

This very gratifying condition, as regards our foreign trade balance, is even more significant in the light of the announcement that our farm crops for 1915 are some \$500,000,000 over the previous year. The government's final crop report for 1915 shows a record-breaking harvest valued at \$5,500,000,000.

While many are accounting for the present prosperity and activity of our commercial enterprises by crediting it all to the demands of the European nations resulting from the war's continuance, it is well to remember the large influence on the general situation that has been prevalent owing to a realization of the enormous prospective value of our farm products.

This year's remarkable yield, coming after a banner season last year, will furnish a basis for an indefinite period of prosperity.

It means heavy traffic for the railroads, good business for the equipment companies, greater demand for iron and steel and generally better trade conditions everywhere. Although rates for long-term money are abnormally high, and by reason of the war, are likely to remain so for an indefinite period, money for short-time purposes is plethoric.

A Convention Innovation

An innovation that will doubtless meet with the approval of those who attend the 1916 C. B. N. A. convention, at Cincinnati, O., the last week of next September, is that announced in the decision of the committee to hold the exhibition in the official hotel headquarters of the convention. The exhibition will be held on the top floor of the Hotel Gibson, where ample room for the accommodation of accessories, etc., is available.

DATES OF AUTOMOBILE SHOWS

New York City—Grand Central Palace. National Automobile Chamber of Commerce. January 1 to 8, inclusive. Hotel Astor; Importers' Salon; the Automobile Importers' Alliance. January 3 to 9, inclusive.

Philadelphia—Convention Hall; Philadelphia Automobile Trade Association. January 8 to 15, inclusive.

Chicago—Coliseum and First Regiment Armory; National Automobile Chamber of Commerce. January 22 to 29, inclusive.

Boston—Mechanics' Building; Boston Auto Dealers' Association and Boston Commercial Vehicle Association. March 4 to 11, inclusive.

THE TRI-STATE ASSOCIATION PICKS LOUISVILLE FOR 1916

The Tri-state Vehicle and Implement Dealers' Association selected Louisville as the place for holding its annual meeting in November, 1916, at the close of its session at Indianapolis, November 30.

HANDSOME FUNERAL CAR DESIGN

(See illustration on opposite page)

The very attractive body design of the funeral car built by the Sayers & Scoville Co., Cincinnati, O., is worthy of description. The particular model illustrated in this issue of *The Hub* is designed for use as an ambulance, but is also suitable for pall bearers' coach, by equipping it with removable seats. A special feature on this car is the rear door. Instead of the usual double doors in the rear, this car is built with one large door in the rear, which when closed makes it appear as if the back end is built in solid like a regular limousine—no hinges or handle being visible. This is one of the attractive features of this car and makes it very desirable for a combination vehicle. There is also a door on each side opening into the rear compartment. All doors have drop sashes with beveled plate glass.

The ceiling and sides of the interior are finished in neat panel design. Electric dome light in center of ceiling. The floor is covered with linoleum and all windows are equipped with spring roller curtains, and in addition to this the two large glasses on each side of body are fitted with shirred curtains on rods. The entire interior is finished in imitation mahogany.

The ambulance equipment furnished with this car includes spring cot, air pillow, two folding seats and medicine chest. For pall bearers' use, this car can be equipped with six removable seats facing forward if so ordered.

The car is finished in silver gray or black. The general color is silver gray, a very rich shade with plenty of life to it and pleasing to the eye. The wide oval mouldings are finished in a darker tone of gray. This brings out the beauty of the design and makes a harmonious combination.

If black is desired, the general finish is bright black, and the heavy oval mouldings in satin black, making a rich combination.

The Postmaster General has ordered that the size limit of packages for parcel post shipment be increased to a combined length and girth of 83 inches. The old limit was 72 inches and there has been some widespread demand for its increase. The department has also authorized the establishment of a receipt system for parcel post packages similar to that employed by express companies.

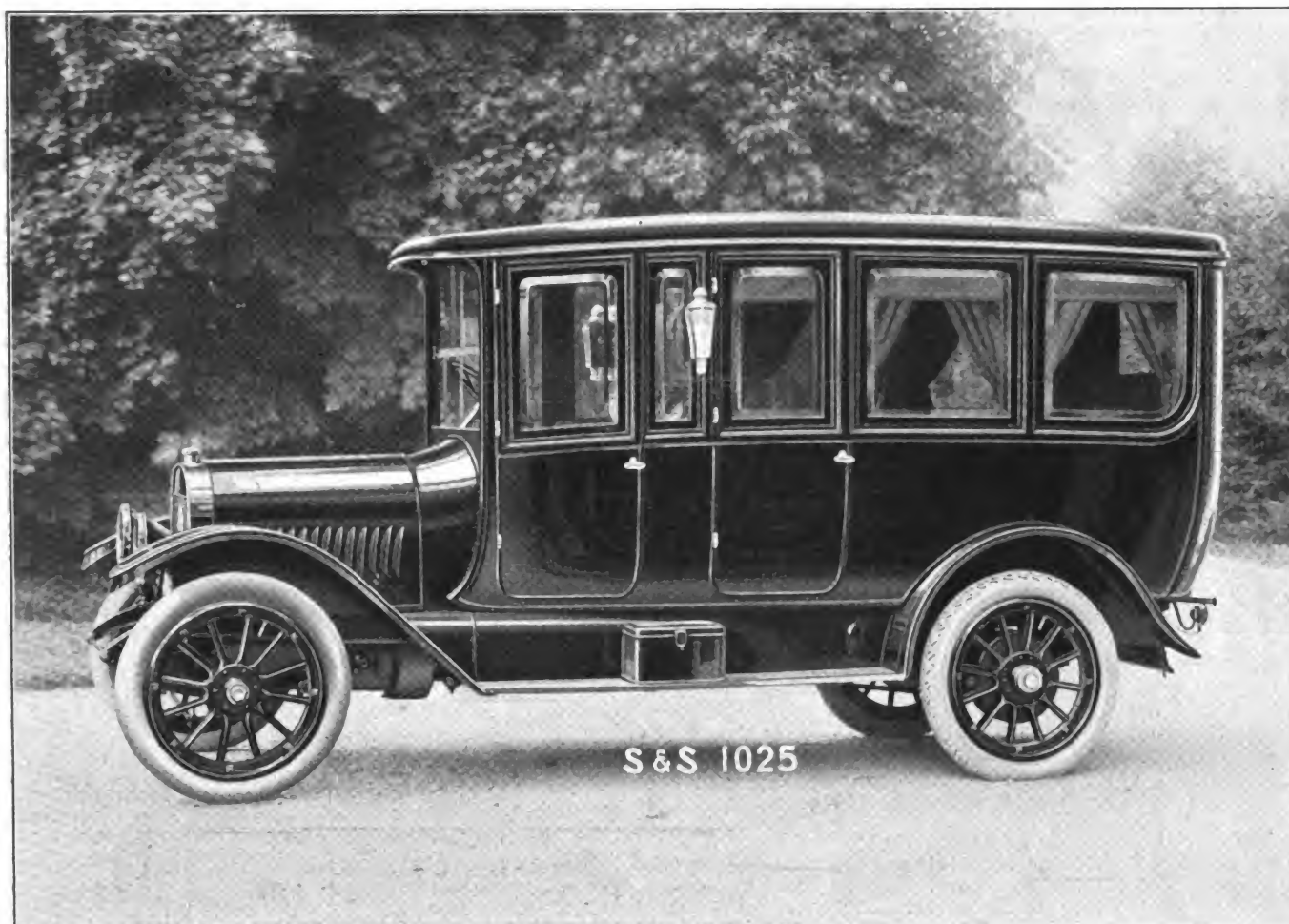
AMBITION

A man with firm and piercing gaze
And hair well touched with white,
Stood pensive as the twilight haze
Was melting into night.
"I've wealth," he said, "and ease complete;
Yet for one thing I sigh,
I vainly wish that I could eat
A second piece of pie.

"The hours are gone, alas for me,
When I would never wince
While going through the list with glee
From custard down to mince.
Those joys so strangely short and sweet,
How they have passed me by!
What would befall if I should eat
A second piece of pie?

"A bit of pastry now and then
I nibble half afraid,
My word among my fellow men
Is instantly obeyed.
But I desire no tributes neat,
Nor flattery flaunted high,
I only wish that I could eat
A second piece of pie."

—Horseshoers' Journal.



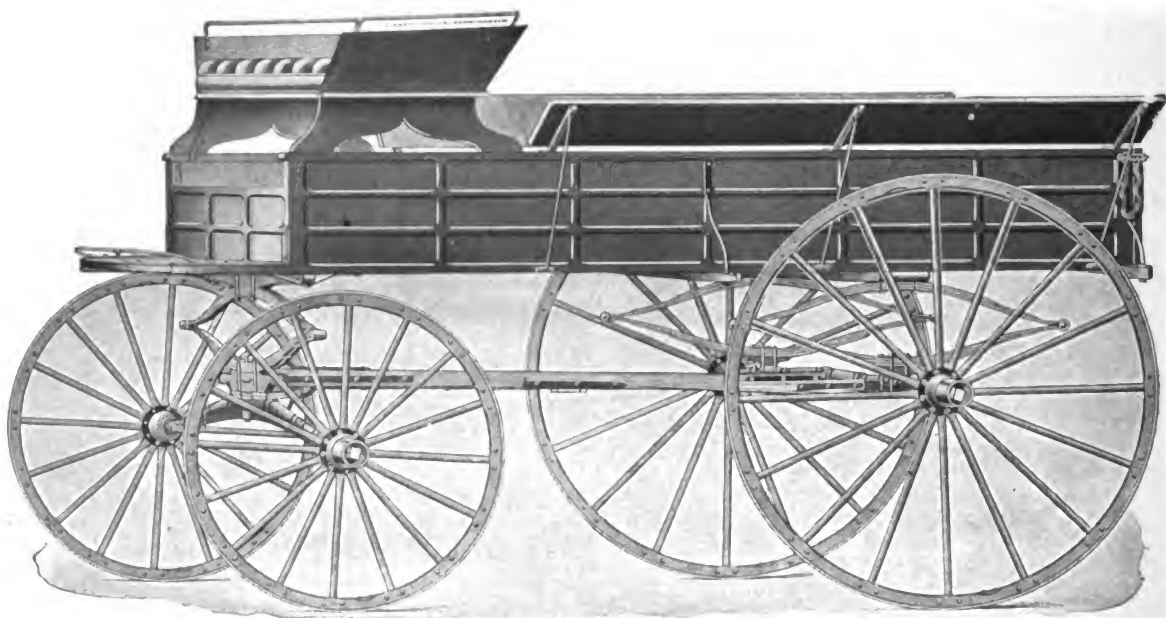
FUNERAL CAR

Designed and built by
SAYERS & SCOVILLE CO.,
Cincinnati, O.
(See description on opposite page)



No. 340—QUEEN STORM BUGGY

Built by
LUTH CARRIAGE CO.
Cincinnati, O.



OPEN EXPRESS WAGON

Built by
MARTIN CARRIAGE WORKS
York, Pa.

PERIOD OF GREAT PROSPERITY AHEAD

Railroads Running at Full Capacity and Steel Industry Sold Far Into Next Year

The last signs of the late depression are disappearing from the business situation. Every lagging industry is coming up into line, and all of the country's activities and productive forces will soon be in full motion. Confidence in the future, says a bulletin of the National City Bank, of New York, has replaced the timidity engendered by the great war, and private enterprise is again busy with the thousands of local projects which represent the natural expansion of a progressive country like the United States. Large new undertakings have not yet appeared, and are not wanted at this stage, for just now there is enough in sight for everybody to do.

The manufacture of lumber and of railway equipment are two industries that have been particularly depressed and hopeless. Everywhere but in the Pacific northwest the former has undergone a very rapid change in the last month.

The railway equipment concerns have taken a large amount of munitions orders, but have also received important railway orders from Russia and France, and within the last month the home roads, with increased earnings in sight, have turned loose a large volume of business. The general condition of the industry is indicated by the fact that the Pennsylvania Railroad has declined all bids upon 9,000 freight cars and will postpone their purchase.

It is needless to refer in detail to conditions in the steel industry. It is sold ahead far into the next year, and leading producers are withdrawing their offers on European business in order to take care of the requirements of home customers. A somewhat sensational message was cabled from Paris recently to the effect that American steel makers were taking advantage of the situation to exact high prices, with the result that permanent business would be lost. No way has ever been discovered to prevent the price of a commodity from rising when the demand exceeds the supply. Even if the producers' price is unchanged the market price will rise upon secondary sales. A new influence now congesting the steel industry is the construction work for enlargement of steel plants. The last great movement for an increase of capacity was in the period from 1900 to 1907; apparently another extensive enlargement is now about to be made. The United States Steel Corporation is just putting its new \$10,000,000 steel plant at Duluth into operation. In the Pittsburgh district it has recently built a zinc smelter costing \$3,000,000, completed to a stage permitting operations in 103 days from the time ground was broken. Other important additions to capacity are being made in the Pittsburgh and Chicago districts, while consolidations and reorganizations in eastern Pennsylvania are preparatory to further developments.

The metal mining interests are very prosperous.

The coal and coke industries are busy up to the limit of the labor supply, and it may be said that generally throughout the industries in which male labor is required the limit of capacity with the present labor supply has been about reached. This is a fact for the consideration of people who have been favoring drastic changes in our immigration laws.

The railroads have come suddenly into a great period of prosperity, as the result of well balanced traffic close to the capacity of their equipment. On account of the great fixed investment which the business requires, net results in railroad improve rapidly as traffic rises close to capacity. As they must be always anticipating and providing for future business, it is seldom that for any length of time they can utilize their capacity as completely as is the case just now. If the volume of traffic is maintained they will be in position to make extensive improvements, and expenditures upon these will be very helpful in maintaining prosperous conditions.

All of the industries and occupations which rely directly upon

the patronage of the public are, of course, helped by the general state of employment which now exists. The boot and shoe industry, last year very much depressed, is as busy as can be. The same is true of the textile industries and of other lines generally.

The broad improvement which has taken place in the last two months has given much encouragement as to the endurance of this term of prosperity. There is much war order business in it, but there is a very large volume of other business waiting, and there is growing confidence that the export business will continue good, at least for a considerable time, after the war. The statements of a French official commission charged to make plans for the reorganization of French industries after the war, and now here to study American industrial methods and equipment, is of much significance. These gentlemen say that French industries must be reorganized with a view to greater use of labor-saving machinery, and that they will want to buy largely in the United States as soon as the war is over. Mr. Charles Lancaster, vice-president of the Liverpool Chamber of Commerce, in an address made a few days ago, declared that the British output could be doubled and trebled, by employing labor-saving machinery. These utterances are indicative of the means likely to be adopted to overcome the losses of the war. There is an implied suggestion of more effective competition when the reorganization is complete, but the reorganization itself will be a large task.

At the end of the war the United States will have the most thoroughly equipped and organized industries in the world, and if the proper spirit of co-operation exists between managers and workers there should be plenty of work for them in setting the world in order, replenishing its supplies and bringing it up to date. It will be a situation demanding a world outlook, with a high degree of ability in the leaders of industry, a high degree of sagacity and courage in financial leaders, and a large degree of co-operation on the part of the investing public of this country. We will be able to sell any quantity of goods if we keep our costs down to fair figures and will extend credit.

KEEPS WINDSHIELD CLEAR WITH HEAT

There have been a number of mechanical devices designed to keep the windshield of a motor car clear in a driving rain, but most of them rely on either mechanical wiping off, or on coating the glass surface with a chemical preparation which sheds the water. An entirely different idea is embodied in the new "electric" windshield cleaner, which has just appeared on the market. This device consists of a coil of resistance wire in an oval frame, hung close to the glass directly in front of the driver's face. The electric current generated by the starting and lighting dynamo, or the ignition system, is passed through the resistance coil and heats it. The heat is communicated to the oval space of the windshield, so that water falling on this spot is dried up.

HANDLING USED WAR TRUCKS

It is the intention of the German government to form an alliance with motor truck manufacturers for the purpose of organizing the return of used war trucks to the general public, under conditions which will preclude a panic and will guarantee satisfactory prices for used trucks in good condition. The plan, as outlined, comprises the gathering of all returned trucks by one large company under government supervision, and the placing on the market of one-third of the trucks each year for three years. A company has now been incorporated for this purpose under the name *Feld-Kraftwagen Aktien Gesellschaft*, with a capital stock of 1,000,000 marks. The directors include leading men in the business world of Germany, government officials and bankers. All requests for information should be addressed to the *Disconto Gesellschaft*, Berlin, W. 8.

NEARLY 10,000 REPLIES RECEIVED**Business Men Giving Trade Commission Facts For and Against Export Combinations**

Business men are responding promptly to the Federal Trade Commission's general inquiry regarding foreign trade conditions. Manufacturers and export merchants are acquainting the commission with the problems confronting them in foreign trade, and much valuable information is being obtained through letters and through the return cards and schedules which were sent out.

Nearly 10,000 replies have already been received. While these have not yet been tabulated, the commission states that business men are giving their views frankly in regard to the advantages and disadvantages of co-operation in export trade.

A machinery manufacturer with a large European business, says:

"On each trip I have realized more strongly the difficulties and the deficiencies of the American manufacturer in his export arrangements, and also I have realized the necessity for training and knowledge and experience and co-operation to get a successful foreign business."

An important southern lumber manufacturer states:

"We are heartily in favor of a selling organization composed of American lumber manufacturers catering to the foreign buyers. We are of the opinion that such an organization would be in position to obtain lower ocean freight rates; to give closer attention to distress shipments either at American ports or foreign, provide for safer methods of payment for the goods; take advantage of difference in exchange; obtain better rates of insurance; give greater publicity to various species of woods; establish a territory of greater distribution and develop a market for waste, such as pit props and firewood."

A producer of wire and wire goods writes:

"Our observations and investigations of the export situation have shown us that co-operative organizations are almost a necessity."

Another manufacturer says:

"We have tried many times to do business in South America as well as the Orient.

"For a small concern this is an utter impossibility. We have had an exasperating experience with port duties, consul fees, fines for improper wording of bills of lading, improper boxing, improper net and gross weights and cubic contents, and dimensions.

"We are satisfied that these things, as well as the financing of export operations can only be taken care of by large organizations equipped for the purpose."

Not all manufacturers are in favor of export combinations. Some fear they would prove oppressive, while others explain that the special nature of their own products or other reasons lead them to doubt the efficacy of combinations in their lines. A New England shoe manufacturer, whose products are known internationally, writes:

"We have had 15 years experience in foreign trade to all parts of the world, and we are decidedly of the opinion that where the article that is to be sold is in common use in the countries in which it is being offered, and it is of sufficient volume in quantity and amount, it is decidedly better to be represented by an individual salesman whose business it is to push that article for the house employing him."

A lumber manufacturer wrote:

"We ourselves would not be interested in a common selling agency for export stock. We believe, however, that some benefit could be obtained by co-operation among the various exporters, and feel that it would be in the public interest."

The spirit of many letters which are coming in to the commission is illustrated by the following expression of a manufacturer of asbestos goods:

"We have received samples of German make which we were

required to duplicate in quality and price. We supplied a better quality and equaled the price. We are very enthusiastic over foreign trade, and we are anxious to hold same after the European war is over.

"Our motto is 'Made in America,' and we intend to assist to make said slogan ring in all the markets of the world.

"We seem to dislike the idea of combinations for securing export business. But we have open minds."

That many business men are seriously concerned by the prospect of wholesale dumping of foreign goods upon the domestic market at the conclusion of the war, is evidenced by many letters on this subject. Thus, a large manufacturer of dental supplies says:

"We are ready to co-operate and do anything we can to bring about better trade conditions in any part of the world, but we are in close correspondence with manufacturers in Germany particularly, caused by the fact that Germany was a very large producer of the world's output of dental goods; consisting of instruments, filling material and so forth prior to the war. We are receiving letters from the manufacturers in Germany showing, notwithstanding the fact that the war is raging and their people are mostly at the front, that their dental and other factories are running to the limit, supplied by female or child labor where they cannot get men, and they are storing up millions of dollars worth of goods against the time when this war shall be no more. When that time comes any sane man can imagine what will happen."

A prominent coal and iron company writes:

"We have recently, at considerable expense, put up plants here in connection with our by-product coke ovens for the manufacture of benzol, tuloil and solvent naphthas. There is no doubt in our minds but that we can continue these plants in operation after the war, provided we are only called upon to meet legitimate competition; but the well known German dumping policy, if carried to its ultimate conclusion, will undoubtedly force us to shut down these plants as soon as the Germans are in position to resume shipments to this country unless some amendment is made to our tariff law to prevent this unfair competition."

Many writers emphasize the handicap resulting from the lack of American-owned ships. A northwestern milling company says:

"We are particularly interested in securing protection for the American manufacturer or shipper against restraint of foreign trade resulting from difficulties and handicaps imposed by foreign owned steamship lines. We realize more every day that the American manufacturer or shipper is entirely at the mercy and in the hands of foreign owned steamship lines.

"Foreign owned steamship lines are receiving in return for hauling wheat and wheat products from American seaports to European seaports at least 50, if not 75 per cent. of the total value of American wheat and products that are being exported to Europe. We are in position to substantiate our statements with specific and dependable data in our possession."

The commission is much interested in the information obtained thus far, and will push the inquiry with all possible dispatch in order to lay the facts before Congress. Further announcements will be made by the commission as the investigation progresses.

AUTOMOBILES CUT BANK DEPOSITS

Actual proof that the extensive use of automobiles is cutting heavily into the bank deposits in the western states was furnished at the meeting of the Wisconsin Bankers' Association in September. Figures produced at the meeting showed that \$70,000,000 in cash had been withdrawn from the banks of that state for automobile expenses alone in the shape of straight withdrawal of deposits, money borrowed or notes purchased. As a result, said the bankers, money is actually scarce in the state.

THE CITY HAULAGE PROBLEM

A Comparison of the Three Types of Transportation Equipment as Used for City Haulage

H. F. Thompson, of the electrical engineering department of the Massachusetts Institute of Technology, recently announced in *Motor Truck* the result of a four-years' study of city haulage problems, which included detailed investigation of horse-drawn truck haulage, electric and gasoline types.

The cost of the work was borne by the Edison Electric Illuminating Company of Boston.

One of the most significant factors evolved, of interest to those connected with the business of city haulage, is that the horse is still in the lead in the achieving of satisfactory results, up to the limit of two miles. Outside of this limit, the comparisons tend to show the electric and gasoline trucks as being of superior efficiency.

Four Years of Investigation

In preparing the paper the work continued over four years, from 1911 until well into 1914. Detailed studies of hundreds of haulage systems were made in the city of Boston. Tape recorders were attached to vehicles of all types and these were figured up against detailed cost records and records of work done which were made by the concerns operating the trucks. Many instances were also secured from other large cities, not only in the east, but all over the country.

Conditions and results were found to vary greatly, but a general average of all the performances was taken by means of curves and on these general averages the conclusions of the report are based. While the variation in individual experiences shows that they cannot be taken as infallible guide to the results of truck operation, they constitute a much more reliable basis than has previously been available for estimates on the subject.

That part of the study relating to the comparative value of hauling methods is divided into three sections—one relating to parcel delivery, such as a department store must handle, another to bulk goods, of which coal is typical, and a third to freight hauling between stations and warehouses.

Delivery of each sort was divided into three classes on a basis of distance—one zone within two miles of the loading points, one from two to six miles, which is about the limit of electric operation on a single battery charge a day, and one beyond six miles.

The summary of results shows that within the two-mile zone the economy of horse-drawn and electrical vehicles is substantially the same; from two to six miles, or the limit of its effective use, the electric is cheaper than the horse and the gasoline truck; that at eight miles the gasoline truck becomes more economical than the horse, and that beyond the range of the electric the gasoline vehicle is at present the only economical means of delivery. See Fig. 1.

Fuel Cost Minor Item

To take care of variation in the price of gasoline or of electric current, these curves were

plotted to show results with electricity costing two cents per kilowatt-hour and four cents per kilowatt-hour, and gasoline costing 12 cents and 20 cents a gallon. As the cost of energy is only from 6 to 10 per cent. of the total cost of operation, these changes in price are shown to have little or no effect on the comparative economies.

In the case of bulk goods, the two-horse truck is shown to be cheaper on deliveries in the two-mile zone than either the five-ton electrics or five-ton gasoline truck; at two miles the electric becomes the cheaper and continues so to the limit of its range of operation, and at $3\frac{1}{2}$ miles the gasoline truck becomes cheaper than the horse. See Fig. 2.

In the case of freight haulage to and from stations, the comparisons are made between a two-horse team and a two-ton electric truck. The cost per trip is shown to be substantially identical. If it were possible—and no doubt it is—to reduce the average standing time at warehouses from .7 to .4 of an hour and at the station from an hour to .7, the electric truck would show a saving of seven cents per trip.

The report indicates the opinion that the economical zone of the electric truck could be extended in both directions by intelligent effort. It could be made more efficient on short hauls by reducing standing time, and more efficient for longer hauls by the use of boosting equipment for recharging the batteries, or by the battery exchange plan.

The investigation of the general conditions of city haulage disclosed nothing that has not been generally known by truck men. It indicates that the expense estimates made by many truck manufacturers have been proved by an average of actual

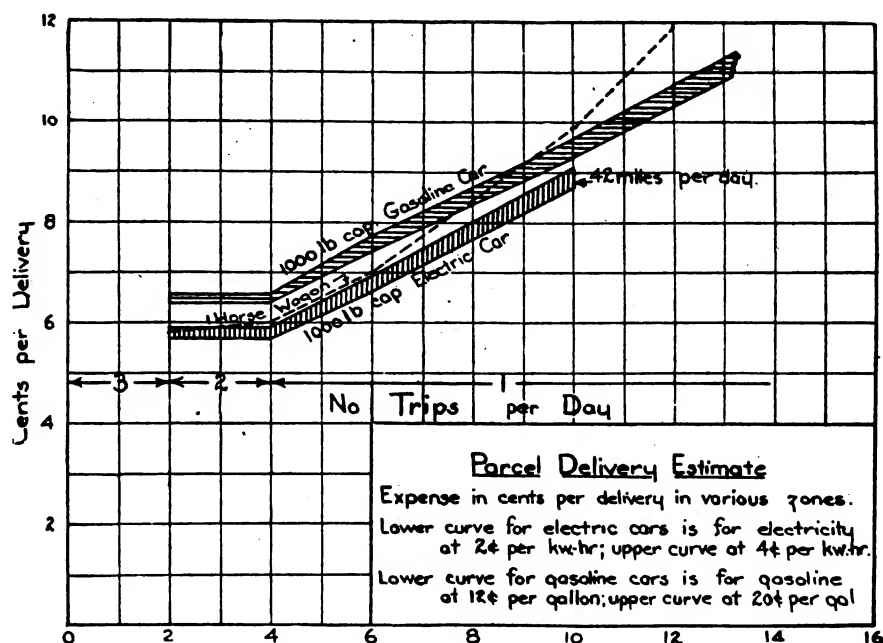


Fig. 1—Plot of the estimates for parcel delivery covering one or several routes a day

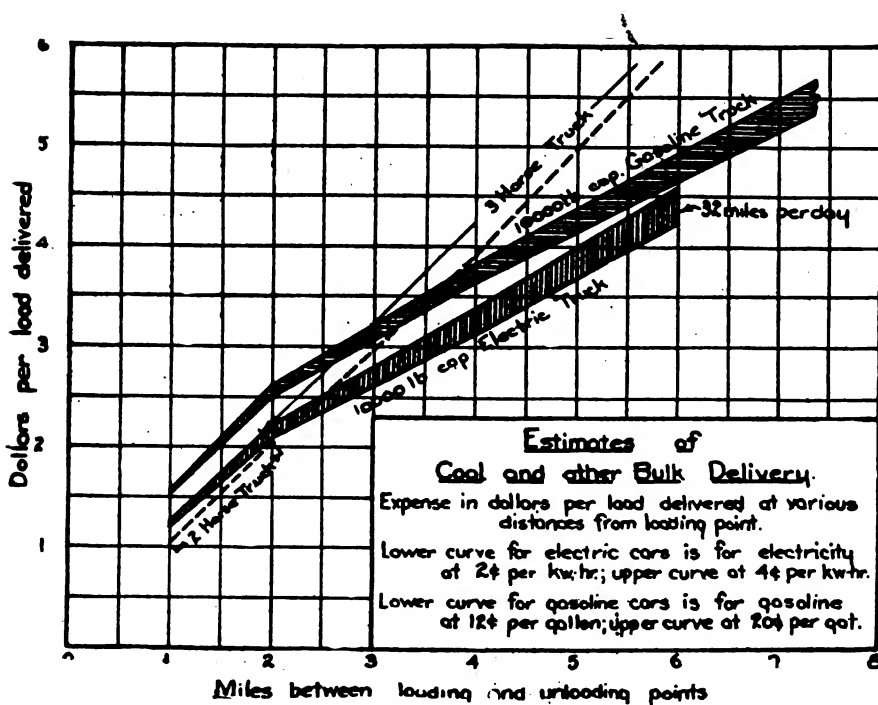


Fig. 2—Plot of the estimate made for the delivery of coal in an urban business

expenses of many operators to have been in general too low, but this has not greatly affected the comparative economy, as the careful analysis of horse costs made has shown horse expense to be generally higher than most horse operators have supposed, if, indeed, they had any reliable knowledge on the subject.

The average mileage of a horse over city pavements is shown to be about 15 miles, though some do 18 or 20, and may for short periods do 25 miles. The average speed of horse travel is about four miles an hour, so that if he does 15 miles he is actually in motion only $3\frac{3}{4}$ hours and is standing $6\frac{1}{4}$ hours.

As a result of this the arrangements for loading and unloading have been such as to consume about the time the horse needed for rest in loading and unloading. If the rest time were cut down it would be necessary to change horses in the middle of the day and that would offset the saving made by the more steady operation.

The two inherent advantages of trucks over horses are that they move faster and that there is no physical tiring of motive power. In many instances the truck is more economical than the horse, even operating under the horse conditions of long standing time, and as standing time is reduced truck efficiency increases.

As long as horses were the only means of hauling, most firms regarded the delivery system as a necessary evil and gave it very little supervision or attention, and were often ignorant of haulage costs. Some trucks were at first operated with the same carelessness, but the tendency of truck operation has been to increase the degree of supervision given to both truck and animal hauling.

The adjustment of conditions to the needs of the motor truck has made much progress with chutes and dump bodies for bulk goods, crate bodies, interchangeable bodies, and so on. The use of a speedy vehicle, such as a truck, has had a psychological effect on the men which speeds them up as compared to the way they work with horse teams.

Conditions in the haulage of freight from

stations, warehouses and stores were found to be very inefficient. Much time was lost at the freight station, but considerably more at warehouses, because goods were not ready or elevators were busy or some similar cause. Another great source of loss lay in the fact that many of the vehicles ran with only part of a load for much of the working day.

The time studies showed that an average of 29 minutes was required to unload at the freight houses, as compared with 38 minutes at the warehouses. The average loss of time in waiting for a platform at the Boston freight stations was only ten minutes a day.

A study of the loads carried to and from the stations in New York and Boston indicated that the horse rigs were usually loaded to only one-half of what they could have carried. A system by which all trucking would be done by the railroads or by a single trucking organization might eliminate much of this waste, but is probably impossible at this stage of development.

Suggestions for truck operators drawn from this part of the truck investigation, are given as follows:

The work of a truck should be routed with a view to avoiding idle standing time and unnecessary retracing of the route.

Every reasonable effort should be made to keep moving; in operating a mixed system of horses and motors, it should be remembered that a motor represents more investment and more earning power than a horse wagon.

The mechanism of a truck should be carefully inspected at least once in two weeks and a written report thereon made to the superintendent.

A truck should be entirely overhauled once each year in order that worn parts may be located and replaced.

All abuse of a truck, especially overloading and overspeeding, should be prohibited.

The interest of the driver in the condition of his machine should be promoted, as the vehicle is furnished by the company to assist him in performing his work; so far as possible a certain machine should be assigned to each driver.

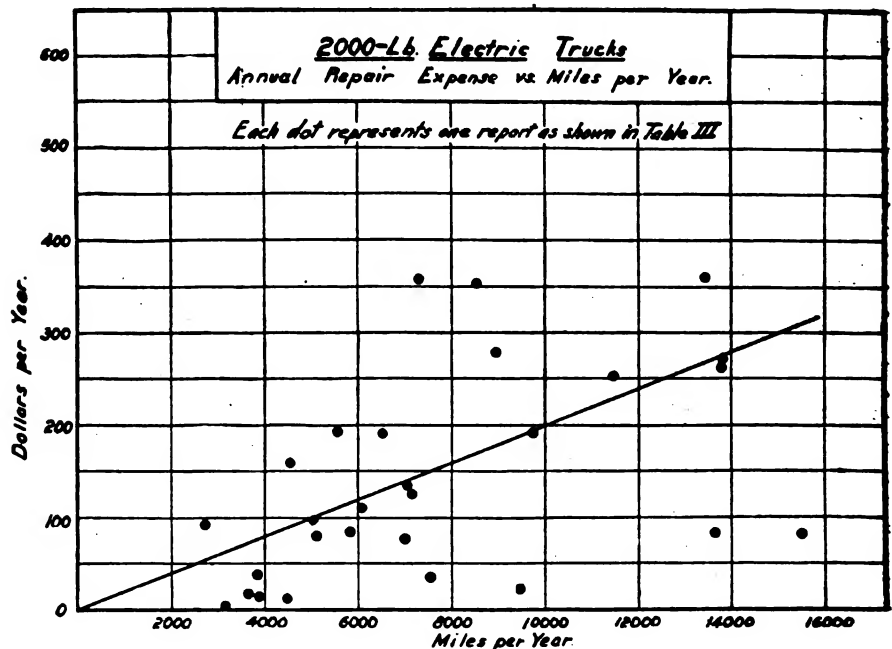


Fig. 3—Plot showing the annual repair expense vs. miles per year

An accurate record should be kept of cost items and performance for each truck; this will assist in arranging the work of the vehicles; it will stimulate the driver to his best effort and it will be valuable in any discussion with the manufacturers of the trucks or their equipment, which may logically be expected.

A wide canvass of truck users was made to secure cost data. This canvass covered 32 companies, operating 780 electric trucks, 41 companies operating 401 gasoline trucks, and 54 companies using 5,787 horses.

In the analysis of this cost data, to arrive at a representative or average expense, it was sought to establish the extent to which each expense item for a given period, say one year, varied with the distance traveled by the truck during the year, the age of the truck at the close of the period, the number of days the truck was operated during the period. Some items, such as tire expense, depend on the distance traveled; others, such as labor, on the number of days the truck was operated. Such items as tire renewals, repairs, painting and battery renewals were included under the term "maintenance expense."

This analysis as shown in the curve of Fig. 3, showed that maintenance on the whole varied directly with mileage. This is not true where the mileage is either very low or very high for the year, but for ordinary use under ordinary conditions it was found to be approximately correct.

In several instances reports were had upon the same truck or trucks at different periods in their age, so that comparative maintenance expense for several years could be judged. In the case of electrics this led to the conclusion that maintenance expense steadily increased during the first 18 months of the car's age, and then remains practically constant up to four years, which was the limit of the investigation. With gasoline cars the maintenance expense was found to increase steadily for the first three years and then more slowly for the fourth year.

Maintenance Cost Per Mile

The average cost of maintenance per mile was then plotted for both electric and gasoline trucks of various sizes. As shown in Fig. 4, maintenance is considerably more with electric trucks if lead batteries are used than if Edison batteries are employed. The figures are with Edison batteries: 1,000 pounds capacity, 4¼ cents; 2,000 pounds capacity, 5 cents; 3,000 pounds capacity, 5¼ cents. With lead batteries the results were: 1,000 pounds, 61/3 cents; 2,000 pounds, 71/3 cents; 3,000 pounds, 8 cents; 4,000 pounds, 82/3 cents; 5,000 pounds, 9½ cents; 6,000 pounds, a fraction more than 10 cents; 7,000 pounds, 11 cents; 8,000 pounds, 11 2/3 cents; 9,000 pounds, 12 1/3 cents; 10,000 pounds, 12½ cents.

In securing averages for gasoline-driven vehicles, trucks equipped with pneumatic tires were differentiated from those

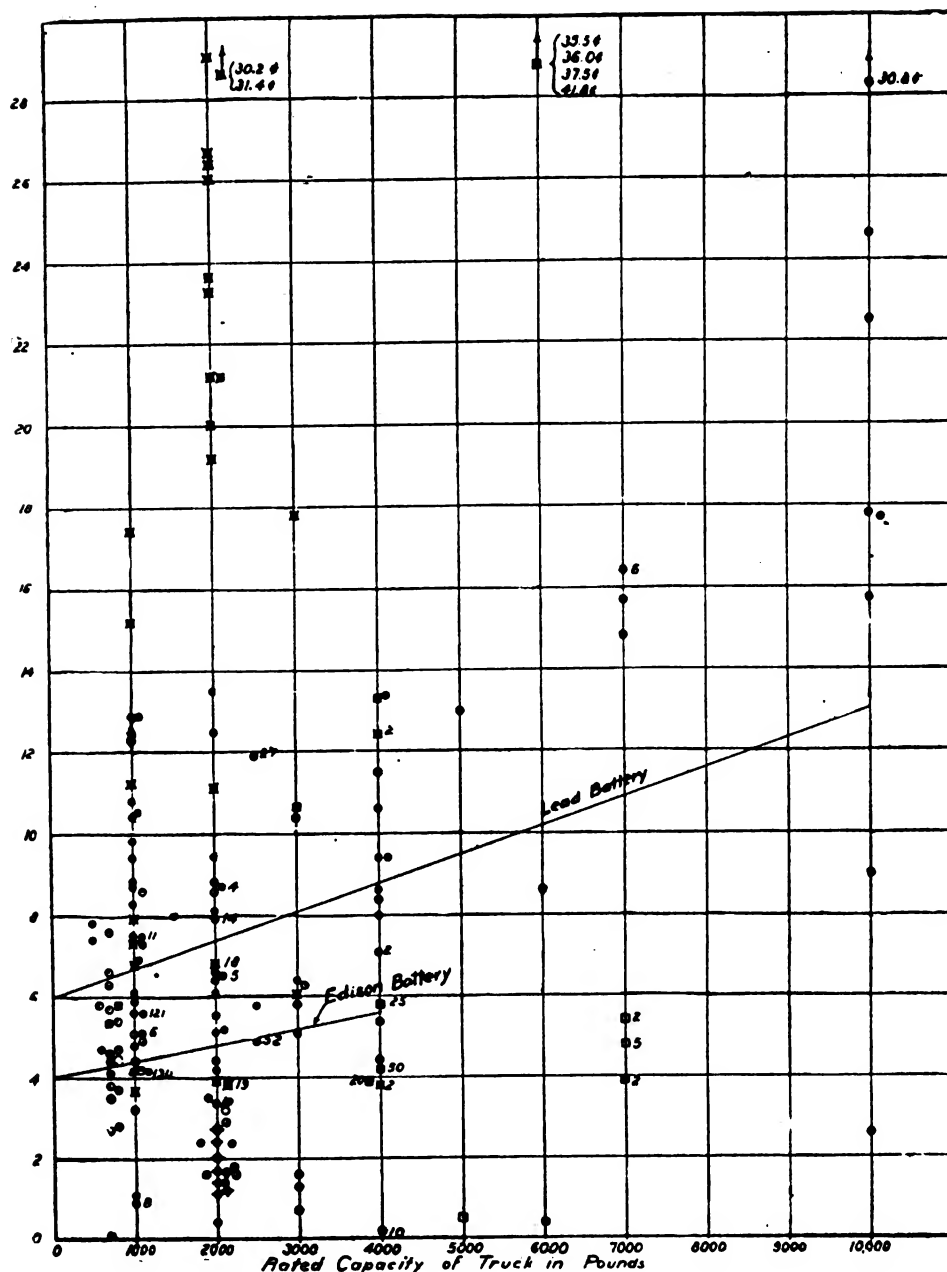


Fig. 4—Electric truck maintenance expense, including lubricant, tire renewals, battery, repairs and painting: Black circle represents lead battery with pasted plates; point within a circle represents Edison battery; point within a square represents ironclad-exide battery; X, trucks more than four years old when reported; cross, trucks less than six months old when reported; numbers refer to number of trucks represented by the point

with solid tires, as theoretically the cushioning effect of the pneumatics should save the mechanism and reduce maintenance expense. The difference was found to be for different sizes an average of three-tenths of a cent a mile.

The following figures are for gasoline trucks with solid tires and represent the average of all the data collected: 1,000 pounds, 6¾ cents; 2,000 pounds, 7½ cents; 3,000 pounds, 8 cents; 4,000 pounds, 9 cents; 5,000 pounds, 9½ cents; 6,000 pounds, 10¼ cents; 7,000 pounds, 11 cents; 8,000 pounds, slightly less than 12 cents; 9,000 pounds, slightly more than 12 cents; 10,000 pounds, 13 cents. See Fig. 5.

The proportions of repair expense chargeable to labor and to cost of parts were found to be 45 per cent. for labor and 55 for parts in gasoline trucks, and 49 per cent. for labor and 51 for parts with electric trucks.

Watt hours consumption per truck mile for electrics and

mileage per gallon of gasoline for gas trucks were also plotted with the following results for electrics:

With lead batteries: 1,000 lbs. capacity, 550; 2,000 lbs. capacity, 630; 3,000 lbs. 750; 4,000 lbs., 825; 5,000 lbs., 850; 6,000 lbs., 1,025; 7,000 lbs., 1,125; 8,000 lbs., 1,225; 9,000 lbs., 1,375; 10,000 lbs., 1,400.

With Edison batteries the averages were: 1,000 lbs., 675; 2,000 lbs., 900; 3,000 lbs., 1,025; 4,000 lbs., 1,200.

Mileage Per Gallon

Gasoline trucks of 1,000 lbs. showed 9 miles per gallon; 2,000 lbs., 7½ miles; 3,000 lbs., 6 1/3; 4,000 lbs., 5½; 5,000 lbs., 5; 6,000 lbs., 4½; 7,000 lbs., a trifle more than 4; 8,000 lbs., 3¾; 9,000 lbs., 3⅝; 10,000 lbs., 3½.

Depreciation averages showed that 12½ per cent. a year for an electric, which is based on an average life of eight years, is about right, while for gasoline trucks, 20 per cent., on a basis of a five-year life, is also approximately correct.

In connection with the figuring of depreciation, Mr. Thompson takes the position that if the interest charge is figured on the cost of the truck with tires and battery, it should be charged on only half the investment. If it is taken on the investment minus the cost of one set of tires, about .5 per cent. should be added to it.

A reliability record arrived at by computing the number of days a year in which trucks were in service when they were needed and ignoring Sundays and holidays, showed an average of 290 days for the electric as against 275 days for the gasoline car.

One of the most interesting sections of the report is that dealing with average horse costs. Such costs have been almost unknown, because so few firms have kept them, and those given here were arrived at by making special arrangements with horse operators to attach tape recorders to their wagons and keep special track of expenses according to the form supplied by the investigators.

For the purpose of analysis horse service was divided into three classes: Bulk goods service, mostly two-horse rigs; parcel delivery service, mostly one-horse rigs; basket delivery service for small groceries, meat markets, etc., and government service, federal, state and municipal. Horse and wagon expenses are separated.

The expense per horse per year was found to be \$295 in bulk hauling; \$312 in parcel delivery; \$303 in basket delivery, and \$485 in government service. Expenses per wagon per year were found to be \$112 for bulk goods; \$103 for parcel delivery; \$91 for basket delivery. No figures on wagons in government service are given.

A typical account for a horse costing \$305 a year was divided as follows: Shoeing, \$34; veterinary, \$6; feed, \$190; stable expense, \$75. The large excess cost in the government figures

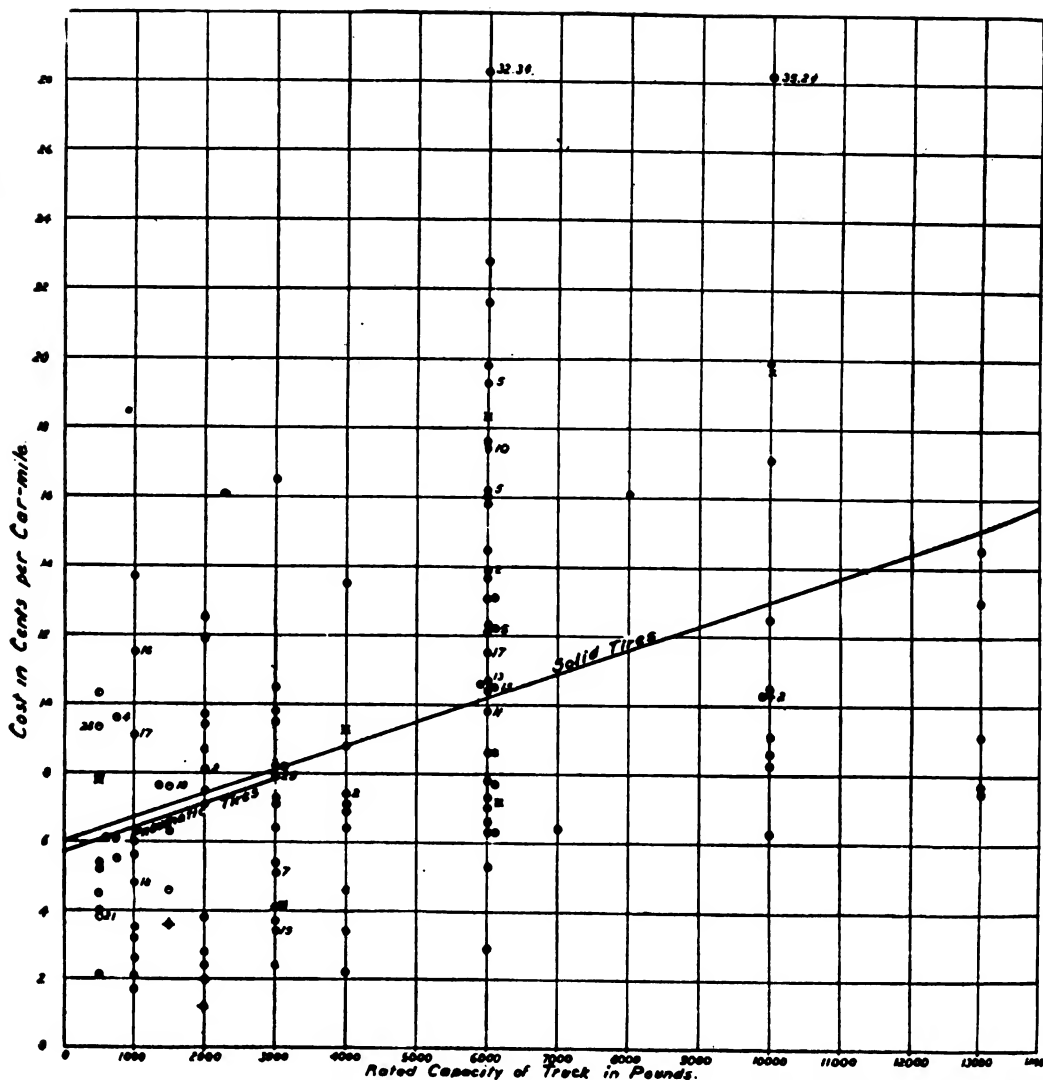


Fig. 5—Gasoline truck maintenance expense, including lubricants, tire renewals, repairs and painting: Black circle represents solid tires used; point within a circle represents pneumatic tires; X, trucks more than four years old when reported; cross, trucks less than six months old when reported; numbers refer to number of trucks represented by the point

is due chiefly to the expense of stable labor, the cost of labor being much larger.

It was found practically impossible to establish an average useful life of a horse as a basis on which to figure depreciation for the reason that practically all city operators are constantly buying new stock and selling their old horses.

A basis for the depreciation figure can be arrived at, however, by comparing the average net expenditure for new horses each year as compared to the value of the stock in the stables. An average based on a large number of instances indicated that an expenditure of about 25 per cent. of the value of the stock every year was necessary to keep the animals in good condition for efficient service, and that leads to a depreciation charge of 25 per cent. A similar annual allowance for the replacement of wagons indicated that 10 per cent. a year was a reasonable figure for depreciation.

HARDENING CAST IRON

Cast iron can be hardened as easily as steel, and so that a file will not touch it. Take one-half pint of vitriol, one peck of common salt, one-half pound of saltpetre, two pounds of alum, one-quarter pound of cyanide of potash, all to be dissolved in 10 gallons of soft water. Heat the iron to a cherry red and dip it into the solution. If the article needs to be very hard, heat and dip the second or even the third time.

SHIPPING HORSES TO EUROPE

The Experiences of a Veterinarian, in Two Chapters— The Voyage

By F. M. Perry, D.V.M.

The French government has bought many thousand horses in our middle western states for her army, now engaged in the great war in Europe, and many British transports have been chartered to carry them to the French coast. I was asked to accompany as veterinarian a shipment of these horses for the field artillery in France and, believing the experience would be a novel one, I decided to undertake the service, even at the risk of being considered a "horse-marine" before the end of the voyage.

The horses were received by the train load at the stock yards at Jersey City, N. J., while our transport lay at a dock in Brooklyn; for, owing to the unusual amount of shipping, there was no berth for our steamer at Jersey City adjoining the stock yards, so that the horses were brought across the harbor to the steamer in huge lighters, looking not unlike great double-decked chicken coops on rafts. On the day of sailing, I joined the ship and found her almost swarming with carpenters hastening to finish their work of fitting up partitions, stalls and mangers, also runways to between-decks, holds, etc.

The stalls ranged along the sides of the ships, facing inboard, a few separate stalls being placed amidships, wherever there could be found space between donkey engine and hatches, etc.

The horses on the upper and bridge decks were protected from the weather by having matched planking built up from the rail and by a rough narrow roof extending inboard above their heads.

The carpentry work, though rough, was really a marvel of ingenuity and practical adaptability. Even before the sawing and hammering had stopped, the tugs were alongside with the lighters, each double-decked lighter holding over 300 horses, the quota for our transport being 662.

The three foremen and 16 hostlers, who were to feed, water and care for the horses on the voyage having arrived, the work of embarking began. Gang planks were placed from ship to lighters and long files of horses were soon being led aboard and down, down the runways to between-decks and the hold to their respective stalls, till all were filled, including those on upper and bridge decks; each horse occupying two feet six inches space in width and with halter ropes tied to the heavy timbers running along the front of the stalls, they were needfully prevented from moving about or from lying down throughout the voyage. The sounds of sawing and hammering were soon obscured by the pawing and neighing of the horses as they found themselves in their strange surroundings, and they looked at each other as if to say: "After six days in that wretched, crowded noisy train and the cold drafty stock yards, what next?"

The empty lighters slipped away out of sight; the carpenters gathered up their tools and went over side; the hostlers and crew were "signed on" the articles; the pilot came aboard; and our lines were cast off; a fussy little tug gave us a push out into the stream and our engine started. So, on a bright, crisp morning, we headed out for the fair coast of France, with our good ship Volnay crowded above and below with war horses that are probably not to see their native land again. As we neared the imaginary line, marking the so-called three-mile limit from shore, we were stopped by a British battleship and cruiser who wished to know our nationality, cargo and desination, and learning that the ship was British and had horses for one of the Allies, they signaled us to proceed.

The hostlers, under their foremen, began to busy themselves with opening large bales of horse blankets and fitting them upon the horses occupying the upper and bridge decks, those placed alone amidships, and therefore more exposed, receiving two blankets. This took nearly all day, but all were glad to give

this added comfort to the animals under our care. Then it came time for water and feed, which were given at regular hours twice a day. Huge casks, open at one end, were set about the decks above and below and were kept filled with fresh distilled water from the ship's pumps and from them taken in pails to each horse.

The various feeds were of the best quality, clover and timothy hay mixed, oats and also a mixed feed consisting of chopped alfalfa hay, crushed oats, ground Indian corn and molasses. This mixed ration was the most relished of all after the first few days and the horses had acquired an appetite for it. It was indeed droll to see how, whenever it was being measured out to give them, their eyes would bulge out and glisten and the saliva would flow freely as they munched it down, and seldom was a morsel left. The hay taken aboard in large bales was shaken up and strewn along the deck just in front of them, while the grain and mixed feeds were given in individual wooden mangers hung in front of each horse at feeding time by means of strap-iron hooks attached to each box or manger and made to fit over the heavy plank extending along in front of all stalls. The gentle off-shore breeze that followed us out increased as we steamed further and further from land, till on the next day, we found ourselves in almost a full gale of wind which kept with us all the way for 17 days, till we entered the river Gironde in France. Two or three of the horses were thrown off their feet by the rolling, wallowing and pitching of the ship, but by the second day all had found their sea legs and balanced and swayed unceasingly, like acrobats day and night throughout the rest of the voyage. As the ship would roll down to starboard, all on that side would brace hard with their hind legs and thrust their heads and necks far out beyond the eaves of the shelters, while those on the port side would draw all heads in out of sight and settle back on their haunches and even while dozing off to sleep at night never lost this motion, regardless of the angle of the deck under them. A number were seasick for a few days and hung their heads in a most dejected way. Two had colic from over-eating under new and strange conditions, and others had various horse ailments from which, however, most of them recovered.

But on the after part of the upper deck on opposite sides of the ship and nearly facing each other were two little horses that proved to be more interesting to us than all the others. One was a little dappled chestnut horse, with silver mane and tail, a neat head with white star, large, expressive eyes and pointed ears. The other was a little buckskin-colored horse with black mane and tail and a clearly marked black stripe extending down the middle of the back, a broad forehead and a narrow white stripe running down the face and ending in a little pink spot on the tip of the nose; he also had small ears like those of a pony.

The little dappled chestnut was, perhaps, the most attractive, as he had an unusually round, smooth little body, with heavy quarters, splendid legs and feet and long neck, with lean, bony head. The first officer, whose father raised horses in Derbyshire, said: "He must have had good people back of him; such a head and neck never sprung from mongrels." Both of these horses kept healthy and merry throughout the voyage, never missed a feed of any kind, would readily eat out of hand any little scraps from the cook's galley, a small apple or potato or even stale bread, and were always ready for pettings or caresses from all on board, even from the Hindoo firemen, who, with wide eyes, would shy out around all the other horses, but who always had a caress and a few gurgling words for the little buckskin-colored horse, or the little dappled chestnut horse with silver mane and tail.

These two were the first to awaken and to paw and neigh for their breakfast at the first glimmering of the hostler's lanterns along the deck in the early morning, and indeed it seemed strange to be aroused in mid-ocean each morning by the neighing of horses and the crowing of a rooster, which latter, together with some hens, were carried in a coop placed amidships near the galley.

The Landing

As the days wore on, the characteristics of the horses became known throughout the ship. There was the big black horse with white face, who never lost an excuse to lay back his ears and nip at his neighbors, and he bit the neck and shoulders of the bay mare that stood next to him quite raw, till he was at last tied up too short for further mischief. There was also the chubby roan mare that always kicked the foot-board for half an hour each night, before settling down to sleep and greeted us with the same serenade when awakening in the morning. Further down the line stood a tall sorrel who persisted in winding his neck up in the halter rope and, to free him, the rope had to be cut almost daily. Poor fellow, he was seasick nearly all the way, so doubtless didn't care what he did or how he looked. On two days the gale that followed us most of the time suddenly changed to the northeast and then the ship would go driving into the big green seas and now and again the crest of a tall wave would come booming over on to the shelter roofs on the upper deck and go swishing down over the eaves in and on to the innocent animals within.

And hour after hour, the horses would stand, with drooping heads and ears and arched backs, braving the storm like veteran seadogs, while the water on the deck washed way above their fetlocks with every roll and pitch of the ship as she staggered on and on. At last, on the thirteenth day out, the captain told us that we were in the Bay of Biscay and that on the morrow we should see land. And so, in the gray dawn of morning, 14 days from New York, we found ourselves off the river Gironde and the low hills of France, with a tall lighthouse far out on the sands, intermittently flash-flashing its message to beware of shoal water. We hoped and looked for a pilot, but no pilot would venture out in such weather and so, for three days and nights our transport "lay on and off" steaming slowly back and forth, with the light on the shore winking saucily at us by night and by day standing staring blankly at us with its white walls, as we rolled and pitched and tumbled in full sight of this one-eyed fiend, and that all the animals on board were not thrown off both their feet and feed is splendid proof of the hardiness and nimbleness of our American horse. However, the gale moderating, changed to an off-shore breeze, and our eyes were gladdened by the pilot's sail coming in sight; we steamed in to meet it and soon the sturdy little French pilot was climbing up the sides of the steamer and then to the bridge to direct our course into port.

All day we steamed slowly up the Gironde and long after nightfall made fast to one of the fine stone quais at Bordeaux. How good it seemed to all of us, and doubtless also to the horses, to have at last an even, motionless floor under one's feet, after 17 days of ceaseless tossing. Early the following morning there were marched down the street opposite and on to the quai and then on to the steamer, over 100 soldiers of the French artillery in their brilliant uniforms of blue and red, some in dark blue and some with red trousers and very light blue coats, while some of the privates wore light yellow line coats over their uniforms to keep the latter from being soiled, and many carried large bundles which proved to be, when unfastened, the bridles for the horses, which were to be disembarked by the soldiery. Heavy gangplanks having been hoisted into place and the runways from the holds and between decks adjusted at the hatches, the bridles were then put on the horses and the work of unloading began.

To receive them on the quai were stationed a military blacksmith, with portable forge, toward one end, the veterinary officer nearly in the center of the quai, while further along stood the higher officers at various distances, each under a huge, wide-spreading canvas umbrella, supported upon stout staffs stuck in heavy, wooden pedestals. As the horses were led off the ship, they were taken in turn, first before the blacksmith to have recording number burned into the hoofs; then before the veterinary officer, who seemed to pass as fit all but three, and next before the higher officers, standing resplendent in

red and light blue, beneath the umbrellas, and who appeared to separate the horses into three classes or grades.

And last they all were filed before two soldiers with pots of white paint, metal stencils and brushes, to have white letters and numbers stenciled upon their hips.

Hour after hour horses filed off the ship till all in holds, between decks and on upper decks were ashore and, fascinated by the scene, we of the transport hung over the rail and watched the performance being so brilliantly staged below on the quai with as much interest as though viewing a spectacular play in some favorite theatre.

The little "silver tail," our favorite, went over the side with the others, but when he was led down the line of officers, we noticed that he was promptly placed over at one side, apart from the others; the steward and Marconi operator, who said they knew, were sure that it meant: "Especially reserved for officers."

Some few acts that were evidently not on the program, afforded us all great amusement, for the horses, freed from the confinement of their narrow stalls, and finding solid ground under their feet once again, would often plunge and kick and squeal for pure joy, and now and again one would break away from his attendant and the blue and red soldier would go rolling across the quai, while the little Yankee horse would go careering madly about with the whole French stage to himself in spite of the loud shoutings of precaution and imprecations and wild gesticulations, as the dignified and resplendent ones were forced in most undignified haste to vacate the shelter of their umbrellas, which latter were threatened to be overturned and demolished by this dreadful American disturber of good order and discipline, who, after several high kicks almost compelling him to stand on his head, with hind heels pointing skyward, would usually finish the turn by cutting a wide, swift circle, ending in an abrupt stop, with loud snort and saucy toss of the head, as if to say: "How was that for high?" Always, of course, such would be finally surrounded by a ring of soldiery, who would timorously draw closer and closer, till a firm hand could be laid on the halter and the unpolished American actor be led meekly away to his place in the line with the other horses. The horses on the bridge deck were not taken off by the gangplank but by another method.

A great steam traveling crane that propelled itself along the front of the quai on a sort of railroad track, lowered a heavy chain from its huge beak, and, hooking into a ring on a large, massive box, open at the top, and with swinging door at one end, hoisted it high in air and then lowered it gently upon the deck. A horse was then taken from his stall, walked into the box, the door closed and fastened behind him; the box and horse would be lifted by the crane and so swung out over the rail and down gently to the quai; the door was then opened and the horse backed out, to go through the same branding and inspection as described. The branding, inspecting, sorting and stenciling completed, the horses were all tied up in groups of three, formed in line, and with each group led by a blue and red soldier, the procession moved off the quai and we all waved good luck and farewell as the long sinuous line of blacks, bays, browns and sorrels wound its way along the water front and across the city and out into the country beyond. As we turned toward the cabin for tea and toast, we saw that our transport was empty and still as a deserted Noah's Ark, and realized that on the morrow we would not be greeted by the accustomed reveille of the pawing and neighing of our warrior friends.

That night I dreamed of a wide, green pasture on a sunny hillside, enclosed with neat, white-washed stone wall, a silvery brook running through, and a large herd of horses quietly, peacefully grazing. They looked a little thin and worn, I thought, as though from an ocean voyage, and way up toward one corner, a sweet-faced woman and little boy were feeding crushed oats and barley out of their hands to a little dappled chestnut horse with silver mane and tail.—Our Dumb Animals.

THE FARMER AND THE HORSE-DRAWN VEHICLE

While it may be true that high-priced carriages have almost disappeared from city streets, it is equally true that farmers still use many buggies. Some farmers use more of them than others, but no farmer would be without one or more buggies if he had more money to spend. The prosperity that is coming his way within the next year or two will give the farmer that money, and no matter whether he owns an automobile or not, some of that money is going to pass into the hands of the buggy dealer for a brand new horse-drawn rig.

A great many country roads have been improved, but not all of them, nor will they be for many years to come. Even when road betterment has fully arrived, the benefits will accrue as much to the horse-drawn vehicle as they do to the automobile. Where roads have not arrived at a state of perfection, buggies are an absolute necessity.

Notwithstanding that a great many farmers own an automobile, or have been using one, they have held on to the buggy as well, and with money more plentiful there is going to be as big a demand for the latter as there ever was.

Farmers' sons, especially, find that they cannot get along without a buggy. One cannot steer an automobile with safety and at the same time keep his arm around the slender waist of the best looking girl in the neighborhood. The buggy is one of Dan Cupid's best assistants, and every country-bred man is well aware of that fact. The farmer's wife, too, and his daughter, feel that it is absolutely impossible for a lady to look dignified, graceful or beautiful in a motor car unless the car happens to be an enclosed one, and then the enclosure that protects the lady's dignity and beauty at the same time hides those qualities from public admiration.

Perhaps one of the real reasons why the finer grades of horse-drawn vehicles are coming into use again in some of our city parks is because they give the women a chance to show off their finery—their new hats, dresses and pretty faces, because, as our lady friends have regretfully realized, the automobile affords them no such opportunity.

There is no doubt that the best buggy prospect, these days, is the young man, and that the young man will continue to lean toward the buggy, because it is the best kind of vehicle ever developed to go courting in. When a young man has possession of a good horse and a top-notch buggy, he has as much value as when he owns one of the low-priced automobiles, so they are competitive on that score. But when the young man owns an automobile he must drive with both hands and even with both feet, and his courtship doesn't carry on very well. But give him a good buggy, a soft-cushioned, rubber tired, easy riding buggy and an intelligent horse, which soon learns when to trot and when to loaf, and the way to his sweetheart's heart is easy. What stronger motive can anybody think of than "the love of a man for a maid," and what better reason is there for a young man desiring a buggy than the fact that such a vehicle is often the shortest cut to the affections of that maid. It is a fundamental proposition. If the diamond seller, the confect-ioner, the restaurant keeper and the minister profit through love-making, why should the vehicle dealer be denied his place in the sun.

There is one thing to be said in favor of the buggy that can not be said for the automobile and that is that the farmer has already the motor power, the horses already on the farm, and must have them whether he possesses an automobile or not. Then while he does not grow gasoline and oil on his acres, he is in a position to produce all the fuel, that is, the feed, that his horse motor can utilize.

The automobile, as well as the gasoline engine on the farm are great institutions, as everyone will admit, but farmers with their wives, sons, daughters and the hired man, know there is plenty of work for man's best friend, the horse, to attend to, and they know that he does it faithfully without jumping a

spark plug or congesting his carbureter. Also the fact that a three-year-old colt is a lot younger than a three-year-old touring car counts in the horse's favor, and he makes up in general utility what he may lack in speed or endurance. The horse, viewing the situation from any angle, seems destined to retain his usefulness on the farm indefinitely.

Before the days of the first steam railroad the horse-drawn vehicle had a monopoly of the land transportation business of the country. The steam locomotive came and still the horse multiplied and the carriage makers grew fat. Some of them, but not many, became rich. Then the electric trolley car succeeded and still more buggies were sold. Then next came the bicycle craze, and the annihilation of the horse was predicted. Yet the horse, apparently with no idea of race suicide before him multiplied at the amazing rate of 1,000,000 per year, with the result that the carriage maker took another hitch in his trousers and made more buggies. Now it is the turn of the automobile to take a crack at the buggy. It has spread everywhere, like the locusts in Egypt, even to those places where chattel mortgages are recorded and where the pawn broker holds forth with his three golden balls. And again the carriage man, together with his vehicle, is relegated to the junk pile.

Now everybody admits, manufacturers and dealers included, that there are certain styles of carriages, such as the victoria, the brougham, or, in other words, what is known among carriage makers as heavy custom work, that have been greatly affected by the automobile. But these so-called heavy vehicles never constituted more than 10 or 15 per cent. of the whole number of horse-drawn vehicles built for pleasure use, leaving another 85 per cent. of the horse-drawn vehicle industry almost untouched by the automobile. Even the extremely low-priced cars have not cut seriously into this 85 per cent.

Taking all these facts together, anyone who denies the great necessity for the automobile and the probability of its more general adoption for many purposes is not well informed, but the one who predicts the total annihilation of the horse and the doing away of the horse-drawn vehicle is what the immortal Solomon might call a "phool."

It is not the purpose of this article to enter into anything like a prediction of the future of the automobile, but one thing seems evident, and that is that the supply of automobiles seems to have fairly caught up with the demand, and it is not improbable that the automobile will have the same experience in the future that some of the other competitors of the buggy have had in the past.

It is fair to believe that should the present conditions of the country remain as they are, the buggy industry can look forward to this year and next year, and many succeeding years with confidence and with the well-founded belief that it can repeat in the future the great performances of the past.

DAYTON'S GREAT PARADE

Into 46 divisions the great work-horse parade held at Dayton, September 29, was arranged. Thousands of onlookers lined the streets and saw the greatest procession of horses go by that was ever seen in the city. The parade was arranged under the auspices of the Humane Society of Dayton, but details were perfected by the Work-Horse Parade Association which was formed only last year, and its members now have the serene pleasure of knowing that their efforts meet approval chiefly because interest in the horse is at high tide in their city. 180 winning drivers proudly bore the ribbon given to them for the greatest number of points which called for 25 per cent. for ease and fit of harness, 15 per cent. for hitching, and 65 per cent. for general condition of the horse, no notice being taken of the wagon to which animals were attached. Old "Pete," he is 33 and yet young in action, carried off the blue banner, his owner being J. P. Keogh. The entire affair proved a source of deep interest and real pleasure and Daytonians await next year's event with fond anticipation.

THE DYESTUFF SITUATION

America Should Invite Swiss Makers to Come Here

A correspondent of De Amsterdamer, a leading Holland periodical, writes to that publication an interesting article on the Swiss dye and aniline industry, which has been translated for Hide and Leather. The textile and leather industries all over the world are in a difficult position. The central powers are short of cotton, wool and leather, whereas the allied powers and America are suffering from a lack of dyes and aniline for the leather and textile industries. As a rule the opinion prevailed, that Germany had an absolute monopoly of the dyes and aniline industries. This, however, is not the case. Before the war, some dyes were made in the United States and in England, but this industry has only started to develop in those countries.

In Switzerland, however, there are factories which supply quantities of importance, as they delivered annually 11 per cent. of all the German dyes. There are five large plants in Basel. Before the war, those plants received all their prime materials, coal tar, from the gas and coke factories, from Germany; consequently, the Swiss manufacturers closely followed the Germans in all the agreements the United German Aniline and Dye Manufacturers cared to make regarding the fixing of prices for their products, terms of delivery, etc. In this way a sort of trust was formed.

Agreement Terminated

This came to an end after the war broke out in August, 1914. Germany demanded that Switzerland should not export any dyes to France or England. The Swiss government refused, and Germany thereupon refused to send any more prime materials to Switzerland. It almost looked as if the Swiss factories would be obliged to cease operations. The Basel manufacturers, who are none the less skilled and energetic than their German colleagues, took the matter up with the British government and soon an agreement was made whereby the English would send large quantities of benzol, coal tar, totuol and other prime materials, necessary for the dye industry, to Switzerland, and the Swiss manufacturers would return to the English leather industry the required quantities of dyes and anilines.

Tank cars full of these products were sent to Switzerland, through France, and, to judge by the speed with which the French railroad companies forwarded those cars, it can be concluded that this matter was of the greatest importance and that the dyes were badly wanted. Since then the Swiss manufacturers have produced so much that England is now suffering a great deal less from dye and aniline shortage than is the United States.

Swiss Manufacturers to America?

At present, however, the situation has changed. England cannot spare any more important quantities of prime materials to Switzerland, as these must be used for the manufacture of explosives. Thus, the only country from which Switzerland can obtain its materials is America. Under the present circumstances it is, however, almost impossible to make large shipments of these materials to Switzerland from across the ocean. Enormous quantities are to be had in the United States, there is no lack of capital, commercial force and energy, so why not let the Swiss manufacturers come over to the United States? America, with this staff of technical men, could easily become the greatest dyes and aniline producing country in the world. No doubt the American government would avert any unfair competition during the development of this industry in the United States. Most probable Swiss technical men would be willing to listen to profitable propositions regarding this matter, and would eventually be willing to lay sound foundations for this line of industry in the United States.

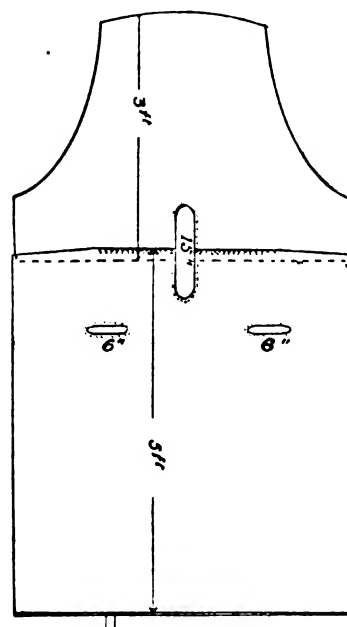
Russia Quick to See Possibilities

Russia has done the same thing. It possesses a large dye factory, which also received its prime materials from Germany.

War has stopped its supplies; thereupon a meeting of the Russian leather and textile industries decided to establish a company for which they would furnish the capital and of which one of the largest Swiss dye manufacturers would become a member. This manufacturer furnished the technical men and took care of the administration. The result is that at present this Russian factory is doing fine and soon will establish several branches. A special department of the polytechnical university of Zurich (Switzerland) has been established, teaching the students the principles and many details of the dye and aniline chemistry.

STORM APRON

The sketch shows a storm apron for use when driving an open vehicle. It is made in two pieces from a good quality of light duck or rubber cloth, about three yards of double width material being required. The two pieces are seamed together



as shown, the stitching being made to go only half way, so that it will fall nicely over the shoulders at the join. The edges of openings for the head and two arms should be lined, to prevent tearing. The particulars are supplied by a subscriber of Australian Saddler and Harness Maker, who has personally proved the value of this apron in wet and stormy weather.

A NEW ALUMINUM SOLDER

Under the trade name Kaylon there is being introduced in Great Britain a new solder for aluminum, which is reported to have given excellent satisfaction. When soldering two aluminum surfaces with Kaylon, it is necessary to scrape away gently the thin oxidized skin on the outside of the metal, either with a knife or a fine rasp. The metal is then warmed in a flame, and the stick of Kaylon gently rubbed over the spot to be soldered. The metal should just be warm enough to melt the stick, but not hot enough to render it liquid. After the Kaylon is rubbed on, the surface is brushed with a stiff wire brush, making the solder combine with the metal surface. The two pieces of metal are then held together and heat is applied until the solder forms a connecting skin. The chief advantage of Kaylon is said to be its permanency, due to its absolute indifference to influences of the atmosphere. The soldered joint will not oxidize, as nearly every other aluminum solder does. Its application in the automobile industry, because of the growing use of aluminum, renders this method of soldering of special interest to Americans.

THE USE OF LAWYERS

In talking the other day with an attorney of national reputation, he suggested that business men could save themselves much trouble and expense by using their consciences more and their attorneys less. In fact, the overcrowding of our courts is not the fault of the courts or the lawyers so much as the fault of you and me who give them so much work. Instead of allowing our consciences to keep us out of trouble, we are careless and do as we please, feeling that we can rely on the courts and the "constitution" when we get into trouble. Instead of meeting an adversary and settling in a manly fashion, we again lie down on the courts. No wonder the dockets are crowded and years are required for a final decision.

Personally, says "Investigator," I sympathize with big business in wishing for concrete instructions as to what it can and cannot do in connection with the Sherman law, but until such instructions are given, it would be worth while to use common sense in interpreting the law, and conscientiously avoid obvious infractions of the law. I am not sure that the law is not sufficiently explicit for the man of big business who is desirous of obeying it, and not seeking to come as near as he can to the line of wrongdoing without crossing the line. The man whose purpose and determination is to deal justly by his neighbor will scarcely require the services of a lawyer to tell him how little he shall do in order to be just. Full measure and running over is about right in these instances. The fact that a man has need to call an attorney to guide him in direct and positive action in relation to his fellows, or in relation to the civil code, shows that he is walking upon doubtful ground and would better retreat at once.

The truth is, it is to be feared, that too many men seek to win an advantage over their customers and competitors, or seek to befriend one interest at the cost of a rival, as instanced by certain of the big corporations. Had the managers of these corporations possessed a conscience they could never have done these things, whether or not the law forbade. Nor would they have needed to employ counsel and expend scores of thousands of dollars in fighting government suits brought to punish them for these obvious offenses. They would have admitted obvious guilt and paid the fines, as some of them did, where they were clearly caught in the wrong, and found admission the part of policy, if not of conscience.

Big business is claimed to be a necessity, and theoretically deserves to be sustained, but it is the big business that is possessed of a conscience that should win approbation, the business that performs a better service and at a less cost to consumers, the business that complies with the accepted rules of right and wrong, as well as the legal code governing in such matters. Not many big businesses are conducted on these lines, although they could make money in plenty if so conducted. Nor would they need a lawyer at hand to tell them when they were behaving properly. Moreover, the same principle holds in all walks of life where men are in association and have dealings with one another.

The man who seeks to drive a sharp bargain knows that he is not acting squarely and would never do it unless his conscience had become hardened by the base practice of himself or his ancestors. Men who employ lawyers to tell them how they can gain an advantage over other and innocent men deserve to feel the restraining and punitive power of the law. But these things are foolish and in the end unprofitable, and when men shall learn even the business value of conscience they will perceive that it pays to be honest, while the moral advantage of fair dealing is, to him who practices it, beyond compute.

Many of my successful friends came from the country, if not brought up on farms. Perhaps you, the reader of this article, may be one of these men. If so, let me remind you that we needed no lawyer to tell us that it was wrong to let our cows jump over a neighbor's wall; that it was detestable

to pollute our neighbor's spring, and dishonest to cut wood on our neighbor's lot. Our conscience told us that these things were wrong, and, if we will be willing, our consciences will do the same work for us today.

HORSES IN EUROPE

Statistics tell us that the German army requires, for complete mobilization, 770,000 horses, and she has about 4,523,000 horses. The French army is said to require 250,000 horses, which probably includes only cavalry, and France has 3,222,000 head. Great Britain requires about 400,000 horses for her army, and she has only 2,231,000. It is estimated that there are about one million horses in active service in the different armies of Europe. It is also said that Austria-Hungary has 4,370,000, Belgium 263,000 and Russia 30,000,000, and the United States 25,000,000 head, says Spirit of The West, Des Moines.

There are five breeding farms and 18 stallion depots in the Kingdom of Prussia, the farms containing a total of over 20,000 acres. The breeding work of the government is partly to encourage live stock breeding in general, as well as for military purposes, but there are two provinces in Prussia known as the "Remount Provinces," where only the military object is considered. The stallion depots are most important from a commercial standpoint, and they contained 3,315 stallions in 1907. These stallions make the circuit from February to June at fees ranging from \$1.19 to \$4.76.

The French government has a breeding farm at Pompadour of 1,122 acres. Aside from this the breeding work is done through the medium of central studs, 22 in number, from which stallions are distributed throughout the country. In 1906 the French government owned and used for breeding purposes 3,321 stallions, which covered 161,614 mares at an average of \$1.47.

In Austria proper there are two horse breeding farms, one at Piber of 1,000 acres and the other at Radantz with 23,809 acres. The government expenditure in Austria in 1907 was \$938,000. In Hungary the great establishment of Mezohegyes, with over 50,000 acres of land, 2,000 horses and 6,000 employees; Kis-Ber, with over 18,000 acres, and Baboina with over 10,000 acres.

The Italian government does not devote so much attention to horse breeding as those mentioned, but 640 stallions stood for public service in 1906, covering 29,462 mares.

England, France and Germany are buying horses in this country, while Russia has plenty of her own. It is estimated by some that they will take at least 100,000 horses out of this country.

It costs Great Britain and France about \$300 a head to deliver an American horse at the front. The expenses are apportioned like this: \$200 for purchase, transportation \$85, insurance \$10, feed \$3, and he has from four to ten days' service in the battle line to pay for himself.

IN A HORSE'S MEMORY

At Palo Alto, California, once the greatest breeding grounds in America and owned by the late Senator Stanford, there lies the remains of Electioneer Palo Alto and Beautiful Bells, the wonderful mother of wonderful horses. Of course, the bones of other and famous horses lie buried in the ground there, but the graves of the three named are held as spots hallowed because of the memory left by those great horses. So precious is everything about their graves held that visitors have difficulty in entering the enclosure unless accompanied by a guard. Recently some Iowa horsemen, who had traveled a long distance to visit the farm, and reaching there on a Sunday, were denied admission, but later those in charge relented and the visitors having been admitted, bore away with them trophies in the shape of geranium leaves from the grave of each horse, which they prize much because of the memory attached to them.

HIRING AND FIRING: THE ECONOMIC WASTE AND HOW TO AVOID IT

It must be obvious beyond argument that every unnecessary dismissal of an employe must mean a definite economic waste to the employer, to the employe, and to society. It seems obvious also that the magnitude of this waste and its influence on the industrial situation is by no means clearly understood. otherwise this important phase of the management of men would have received adequate attention before now. Many managers of large businesses, to be sure, have recognized the existence of this problem and have established specialized employment departments to deal with it. They know from experience that it does not pay to hire and fire employes haphazardly; they realize that it costs money to train a new employe, even a skilled workman, in the special practices that are peculiar to a given concern, and that upon his dismissal, save on the ground of no further need, a similar expenditure must be incurred for the training of another new employe, which expenditure only good reason for the dismissal of the previous employe can justify. In only a few instances, however, have employment departments been placed in charge of men of experience and capacity who are competent to deal adequately with the many and often perplexing phases of the employment situation, while still more infrequently have these employment managers been entrusted with the equally, if not even more, important duty of continuing their personal interest in the men and women while they are retained in the employment, in order that they may be assured of proper training and fair treatment and may not be discharged without good cause. Without this latter function, which he must share with the superintendent or supervising foreman in harmonious co-operation, no employment manager will be able to bring about a satisfactory solution of the hiring and firing problem.

While it is quite important to select the right men and women for the right places so that a square peg may be chosen for a square hole and a round peg for a round hole, it is far more important properly to take care of these men and women when they enter upon their new work. A good man, says M. W. Alexander, in *American Industries*, can be spoiled and discouraged by wrong initial treatment, as an improperly selected man can often be made useful and contented by the right guidance and training. An understanding of human nature, and fairness and firmness in dealing with men are some of the chief requisites of the efficient superintendent of employment. A student of economics applied to industry, he must be imaginative enough to be progressive and yet sufficiently conservative not to break away from old moorings before he has found a clear course ahead. Standing between the employes and their employer, he can, if he is the right man, work to the advantage of both by being fair to both. And if he possesses tact and diplomacy he will never destroy the disciplinary authority of the foreman even though the latter is deprived of the right to discharge an employe beyond terminating at any time the latter's connection with his department. Since the superintendent of employment has brought the employe into the factory, he ought to be the one to discharge him if he should be discharged. Often he may find that the employe's unsatisfactory showing was due to his having been placed wrongly. How much better it is to take this square peg out of a round hole and fit him into a vacant square hole than to discharge him and then experiment with another recruit, a supposedly square peg!

A HORSE MARKET OPINION

A writer in *National Stockman and Farmer* says that one of the questions that is holding the attention of the farmer is: "What does the future hold for the horse breeder?" Anyone who has attempted to answer has met with contradictory opinions, and felt at a loss to know just what to do. If business conditions in the United States were on a normal basis there would now be a scarcity of horses, whereas we now seem to

have an over supply, notwithstanding the fact that there have been thousands of horses shipped to the European countries for war purposes. But when we have in the United States 25,000,000 horses, it is not surprising that the insignificant number sent abroad is not missed much in this time of depression in our country.

The opinions regarding the effect of the war on the horse market in general are unanimous, the consensus being that the removal of rather second-rate horses of the lighter types has benefited instead of harmed us. Horses would have been much further off in price had not this demand come at the time it did. The general depression in business caused considerable falling off in the demand for horses; building trades were tied up which caused no demand in the cities; there was no demand from the logging interests; the south did not have the money to take on the usual supply on account of the cotton crisis.

Will it pay the farmer to continue to breed, and if so what type should be raised? First, yes. Second, draught type. There is absolutely no danger of there being an oversupply of the right kind of draught horses. By good draught type we mean any good grade or pure-bred horse of well defined type. There never was a time when the use of a scrub stallion was either justifiable or profitable. Today, when America owns probably the greatest collection of pure-bred individuals in the world, when it is being cleaned of the undesirable stock, when every condition is right for progress along new lines, the scrub is a greater detriment than ever. We believe the stagnation in the horse business is but temporary, and that there will soon be renewed activity and the normal or even better than normal conditions will not be in the far distant future. Prices will, without doubt, be good for the correct type of any breed of draught horse. Inferior quality may suffer, which is after all the best, most healthful condition possible. Better stock pays, and in order to secure this better stock breed to pure-bred stallions.

RIGHT SPIRIT IN SEEKING SOUTH AMERICAN TRADE

The following is from an address by the Rev. Homer C. Stuntz, bishop of the Methodist Episcopal Church in Buenos Aires and the southern republics:

"The northern or tropical part of South America, save for a few high plateaus, will never have any considerable white population. The white man lives in the tropics as a diver in the sea. He must come to the top to drink.

"But there remains subtropical and temperate South America—Uruguay, Paraguay, northern Brazil, Argentina and all Chili not a desert—an empire of vaster possibilities than that in which the greatest republic in the world has arisen in 140 years. Argentina, a country with the soil of Iowa or Missouri and the climate of southern California, with a strip of the fattest black prairie soil on earth, 1,200 miles long and 700 miles wide and the soil two to ten feet deep.

"This part of the world is to receive great additions of white population from the temperate countries of the world in the coming years. The population will not come from the United States, but its trade will be there for the United States if it wishes it and goes about getting it intelligently. Its resources considered, there is no part of the globe so under-populated.

"How can you get this trade? First, understand it. One thing that cannot be 'made in America' is knowledge of foreign markets. They must be studied on the ground. Second, you must have warehouses there. They can't wait on shipments from the United States. Third, you must build up a Spanish-speaking selling agency.

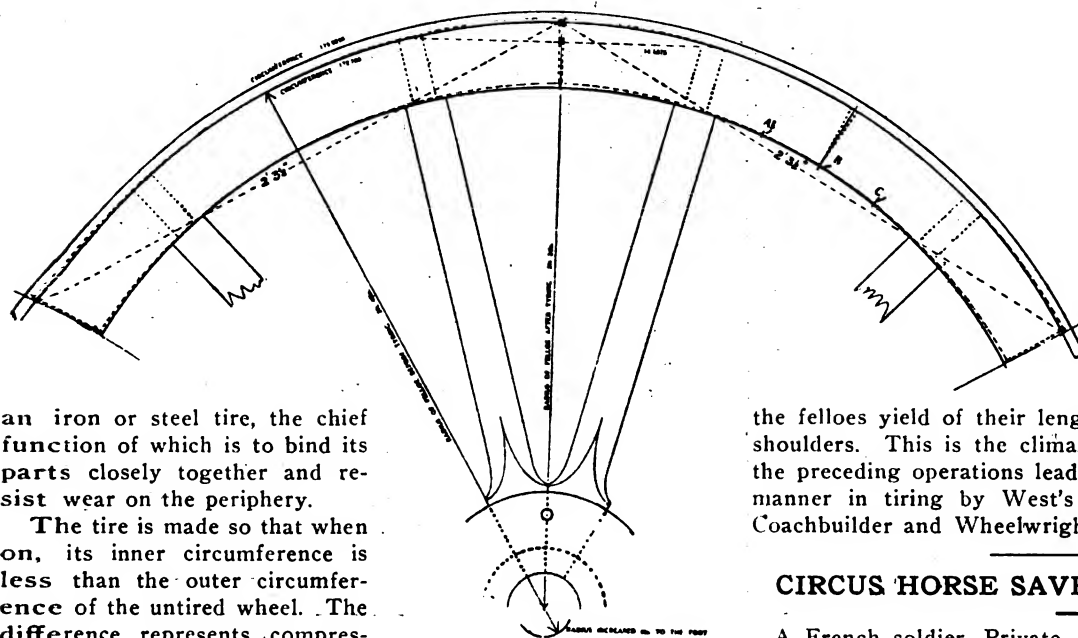
"And, calamity of calamities, do not let the impression go out that the United States is trying to take advantage of the disadvantages of Europe. Go after the trade because it is there, not because the opposition is down and out. Be sportsmen and stoop to nothing unworthy of the great republic of which you are a citizen."

WHY FELLOES ARE MADE HIGH AT THE JOINTS

The rim of a wheel is made with either "felloes" or "rims."

The "felloe" is a short section that covers two spokes. It is sawn or hewn usually from planking. A "rim" is made in two pieces of equal length and bent to the curvature of the wheel.

A felloe is strongest in the middle, between the two spokes on which it rests, and weakest at the ends, because (1) the grain of the wood is not in the direction of the curvature, and (2) the ends overhang the spokes. A wheel is encircled by



an iron or steel tire, the chief function of which is to bind its parts closely together and resist wear on the periphery.

The tire is made so that when on, its inner circumference is less than the outer circumference of the untired wheel. The difference represents compression of the wheel by the tire which, so long as it is within the elastic limit of the wood, keeps the tire tight and makes the wheel serviceable.

The compressive force exerted by the tire in shrinking on the wheel is the same at every point in its circumference, but the felloes are not everywhere equally strong to resist compression. They are strongest where directly supported by spokes and weakest at the joints. Unless this weakness is provided against, the result is a flattening of the periphery at the joints. The weakness is the same with rims as with felloes.

The method by which flattening at the joints is prevented is, to make the periphery high at the joints. To do this felloes are curved to a greater radius than that of the finished wheel. A good working formula is, made the radius of the felloe $12\frac{1}{2}$ in. for each foot of radius of the wheel. Example: The radius for a 4 ft. 7 in. wheel in the wood is 2 ft. $3\frac{1}{2}$ in.; the radius of the felloe will be $12\frac{1}{2}$ in. for each foot and $3\frac{1}{8}$ in. full for the odd $3\frac{1}{2}$ in., that is, 28 $\frac{5}{8}$ in.

The felloes must be cut the length for their final curvature, but mitred for the larger radius, and when in position on the untired wheel will show an open back joint. The result of the flattening at the joints, due to pressure of the tire, will then be the nearest approximation possible for a true wheel.

The accompanying sketch illustrates wheel building in accordance with the principle outlined above.

The felloe is shown in position in a 12-spoke tired wheel 4 ft. 8 in. in diameter over all.

The dotted lines show the shape before tiring. The length of the arc occupied by the felloe is 28.798 inches, and the chord is 27.5, which is the outer radius of the felloe in the tired wheel. Although the felloes are made to a greater radius than that of the finished wheel, the length of the arc is the same, and when the ends are brought down by the pressure of the tire they fill the circle.

The dotted lines on the sketch representing the felloes before

tiring show the joint. It is wider on the outer circumference; that is a necessary condition in view of the figures quoted above, as may be easily demonstrated by shaping a felloe to the exact radius of the wheel and then forcing it to the larger radius of $12\frac{1}{2}$ in. to the foot.

The pitch of the cut-off at felloe ends is found by taking any three equidistant points (A, B, and C in sketch) on the inner circumference of the felloe as bases for two right angles. The mean between the perpendiculars (shown by dotted lines) is the required pitch.

The distance between spoke holes in the felloes is equal to the chord of an arc which is $1/12$ of the inner circumference of the felloes when tired.

When a wheel is accurately made and the tire is shrinking to its place, there is a stage when all felloes are just touching one another and just bearing on the shoulders of all spokes. The tire and wheel are then the same size, and compression is beginning.

As the shrinkage proceeds and compression increases, the felloes yield of their length and are forced hard on spoke shoulders. This is the climax in wheel building, to which all the preceding operations lead, as may be seen in a remarkable manner in tiring by West's cold process.—The Australasian Coachbuilder and Wheelwright.

CIRCUS HORSE SAVES WOUNDED SOLDIER

A French soldier, Private Ambrose Perrichon, owes his life to a German circus horse, which picked him up when he was lying on the field of battle and carried him into the French lines, says a correspondent. Both the soldier's legs were shattered by a German quick-firer. When night came on he heard near him the heavy breathing of a great white horse, which munched the short grass. The animal was riderless, and he whistled to it and began to clap it kindly. The horse whinnied with pleasure. Perrichon was powerless to make the slightest effort on his own behalf. The animal seemed to understand, for it fell on its knees beside him, held its head over his breast and remained motionless. Then it got up and walked round the soldier. At last it stopped, sniffed the wounded man all over, and then, seizing his leather waistbelt in its teeth, it lifted him from the ground and galloped off. When the horse stopped in the advanced French lines at daybreak its human burden was little more than a wreck. But tender care has since brought him round, and he is now convalescent. Perrichon's sergeant, who knows a lot about horses, says the animal which saved his life was before the war in a German circus, where it performed in the pantomime known as "The Arab and His Faithful Steed."

GLASS-ROOFED LIMOUSINES

The material "cellon," described in these columns several months ago as an excellent substitute for glass, is now being extensively used in German limousines as roof material. The entire roof, as well as large windows on the sides and rear, consist of this remarkable substance, and attempts are now being made to construct American limousines on a similar plan. As cellon cannot be exported from Germany at present and an all-glass roof is too dangerous, it is suggested to use the so-called "triplex" glass for this purpose. This glass does not splinter even if struck with a hammer, and therefore does not endanger the passengers. A limousine with glass roof is expected among the novelties at the New York automobile show.

STATES TO SHARE \$850,000 FROM NATIONAL FORESTS

The portion of the national forests receipts for the fiscal year 1915 to go to the benefit of the various states in which the forests lie, according to the computation of the Forest Service just approved by the Secretary of the Treasury, amounts all told to more than \$850,000. The gross receipts for the year ending June 30 were \$2,481,469.35, of which under the law 25 per cent. is paid over to the states for county school and road purposes and an additional 10 per cent. is made available for expenditure by the Secretary of Agriculture in building roads and trails for the benefit of local communities.

Montana gets the largest share, having contributed the largest amount of receipts for the sale of timber, grazing, and other uses of the forests, or more than \$518,000. Of this amount, Montana is to receive \$79,589.78 for county school and road purposes, while the Forest Service will expend \$31,835.91 for improvements of special benefit to local communities and not included in the regular administrative and protective improvements. Idaho comes second with a 25 per cent. allowance of \$75,651.15 and a 10 per cent. fund of \$30,260.46. California is third, receiving a 25 per cent. allowance of \$67,611.37 and a 10 per cent. fund of \$27,044.74. The other national forests states follow in the order of the size of their respective shares:

Arizona, \$59,807.89 under the 25 per cent. provision and \$23,923.16 under the 10 per cent.; Colorado, \$59,218.60 and \$23,687.44; Oregon, \$49,675.83 and \$19,870.33; Utah, \$48,675.96 and \$19,470.38; Wyoming, \$43,086.86 and \$17,234.75; Washington, \$37,445.56 and \$14,978.23; New Mexico, \$31,786.46 and \$12,714.58; Nevada, \$16,244.53 and \$6,497.81; South Dakota, \$12,988.11 and \$5,195.25; Alaska, \$11,165.75 and \$4,466.30; Arkansas, \$8,738.93 and \$3,495.57; Florida, \$2,336.77 and \$934.71; Minnesota, \$1,971.60 and \$788.64; Nebraska, \$1,401.15 and \$560.46; Kansas, \$1,357.33 and \$542.93; Oklahoma, \$759.77 and \$303.91; Michigan, \$198.37 and \$79.35; North Dakota, \$81.83 and \$32.73; Porto Rico, \$9.25 and \$3.70.

The states of Arizona and New Mexico receive additional shares for their school funds on account of school lands included within the national forests, yielding them \$28,966.46 and \$9,311.87 respectively.

On the national forest purchase areas in the east, a total of \$3,977.60 was collected in Georgia, New Hampshire, North Carolina, Tennessee, Virginia, and West Virginia, these states thereby sharing \$994.40 under the 25 per cent. division and \$397.76 under the 10 per cent.

The total amount to be expended under this system of sharing the forest receipts with the states to make up for the loss of local taxes due to public ownership of the land is about \$16,000 greater than for the previous fiscal year, as the receipts for the fiscal year exceeded those of the previous fiscal year by about \$44,000. The provision of law under which a portion of the receipts is turned over to the states dates from 1906, and the total payments reach, with this year's allotment, nearly \$4,500,000. The 10 per cent. provision for government-built public roads has been in force only since 1912, and has now made available for this purpose an aggregate of \$926,000.

THE WASTE OF WAR

The waste of war is more apparent than real. The true loss to belligerents is not the materials expended in combat, but the loss of productive services of the troops engaged in battle. This loss, says American Industries, is not a positive one, but consists only of what might have been produced had there been no war. Even the expenditure of ammunition is not entirely waste. Much of the cost of modern munitions is labor cost and this is conserved to the nation just as truly as though it had been expended in the grinding of flour or the mining of coal, which respectively are consumed by being eaten or burned just as effectively as a shrapnel is destroyed by explosion. No

one would think of describing the sums annually spent for coal as pure waste. It is true the coal is consumed and so is the gunpowder, but neither are of any utility unless thus used. The loss is the loss of services of men producing these commodities when they might have been producing flour to be eaten or woollens to be worn. The difference in relative utility is the measure of loss and the life of these commodities is the duration of the loss to the nation, and it may readily be seen that within a few years after peace, an industrious belligerent will have completely recovered.

It is a question of very nice analysis whether national economy in the manufacture of useless luxuries does not greatly offset the loss of service of men in the field and munition factories. In France the production of laces and perfumes has greatly decreased. Workers in such manufactories have been transferred to the production of munitions and service in the field. If then, for example, there was sufficient economy in luxuries and in necessities, the loss to the nation would only be those things which might have been produced but which were not.

The price of the commodities in no way reflects the loss to a belligerent, whatever the amount of that loss may be. The loss is in economic goods other than money, since the commercial turnover in no way affects the result. Much of the money spent by the belligerent governments, which is frequently considered the measure of national waste, is spent time and again in the course of a war, and finds its way back into the national purse by taxation, to be again expended for the maintenance of the army.

The thing which attracts attention is that all the purchases are being made from one source, whereas formerly they were made by a million individuals.

GROWING INTEREST IN HORSES

It is one of the singular phases of the revolution in travel and transportation through which the world is now passing that, as horses become less numerous on the roads and in the parks, their drawing power seems to increase at all race tracks, trotting meetings, horse shows and other sporting fixtures in which they are the central figures. Something like 30,000 persons assembled at Belmont Park, on Long Island, to see the annual Metropolitan Handicap raced a few weeks ago. More than half as many votaries of racing were at the Aqueduct track, the other day, when Tartar won the Brooklyn Handicap. In each instance the attendance was the largest ever known in many years.

At Fall River, Mass., 20,000 attended a horse show in June, and other record breaking crowds were presnet at the annual shows in Devon, Pa., and Stamford, Conn. Eight thousand went to see some unimportant trotting races at Freehold, N. J., on Memorial Day, and as many as 5,000 have, on occasions this season, witnessed the amateur harness races on the River Speedway, in New York. Everywhere, almost without exception, races and horse shows are attracting crowds which surprise even the most optimistic managers of such amusements, and some of those who try to analyze such things are wondering how to account for this increasing interest. Is it because the high bred horse, disappearing from every day use, becomes more attractive and more fascinating by reason of being missed? —New York Herald.

HIGH PRICE OF HORSES IN HOLLAND

A Dutch breeder of horses on a large scale near Amsterdam, is quoted as saying that since the world began they have never been so high priced. As illustrations, he says that an animal a year and a half old brings as much as 700 florins (\$281) and that a condemned stallion was recently sold for 1,100 florins (\$442). The evident cause of these high prices is the great demand for horses resulting from the present war.

Paint Shop

BRUSH TROUBLES

While varnishers differ in their preference for a particular kind of brush, it may be safely affirmed that there is no more generally serviceable brush for the purpose than what is known as a first class "half-elastic."

A sample set of them costs but little. They are very free from dirt and loose or broken hairs, they carry a good load of varnish to the surface, and while being nicely poised and springy they are stiff enough to give a much quicker and even distribution of any tough working quick rubbing varnish than badger. Turpentine by constant saturation will loosen up dirt and make short hairs, but as our friend says he keeps the brush in the varnish he uses it with, it is reasonable to conclude the quality was amiss. Probably there is no tool that can work such unmitigated discomfort and actual permanent disaster as a poor varnish brush, and of all poor varnish brushes that of the cheap badger variety is the worst.

Against that, on the other hand, the high grade badger made by a responsible firm for which a good stiff price must be paid, and which has been "broken in" on second and third rubbing coats until perfectly clean, may, in the hands of the right man, be the most capable and dependable tool on earth for the finest work that can be finished with a flowing coat, but do not use such a brush for first rubbing coats. Only the man who realizes that his rubbing coats require as much care and cleanliness as the finishing coats, will ever be likely to break in a new varnish brush of any kind fit to do fine finishing with. The matter of "keeping" varnish brushes when not in use is something of a puzzle, and whether the brush should be suspended in the varnish it is used in, or brush-keeping varnish, that is, varnish without any driers, or raw linseed oil, or a mixture of oil and turps, is a point much in dispute. The fact is all these are good, but not all of them are suited to all shop conditions. No one can have a clean brush by keeping it suspended in varnish that has become thick and tough and ropy as it will in time. When varnish is used as the medium in the "keeper" it requires frequent changing, so frequent, in fact, that the small shop with only occasional varnishing to do cannot afford it.

The man who varnishes every day can change it every day if he wants to, what was in the keeper overnight is, when strained (as nearly all varnish should be) available and fit for almost any use. Where this cannot be done, recourse is had to adding turps to the varnish so as to prevent as far as possible thickening. Perhaps the method most in use is to use a mixture of raw linseed oil and turps in the brush keeper, say about four-fifths oil, one-fifth turps, then as the oil shows signs of thickening, which means practically that the turps has evaporated, add turps, and at least once a month empty and clean out the keeper. Strain the contents through two thicknesses of cheesecloth, and make any deficiency good with a mixture in the same proportions as the original. Under any system, "eternal vigilance" is the price of an immaculately clean varnish brush if such a thing there be in any but a few (very few) shops.

The exclusion of air from the brush-keeper's contents is the one point to be gained; we need not consider dust; no dust can get into an airtight brush-keeper. When brushes hang in the keeper make sure they are, at least, one inch clear of the bottom; keep them also clear of the sides and of each other. No matter what vehicle the brushes are suspended in, it is the part of wisdom to rinse in turpentine after taking

them from it, and before putting in the varnish cup discharging the turps from the brush by drawing it once or twice across the wire and then shaking briskly. There will never be any trouble caused by this if the brush is then filled with the varnish in the cup, and drawn over the wire once or twice, then immersed and all let stand a short time, the varnish cup being, of course, protected from dust. All varnish that has had proper storage is the better for being aired an hour or more before using.

The fear of using turps on a varnish brush is that it will loosen dirt and cause the hairs to become brittle and break and thus shed short hairs. The rinsing in turps here recommended will not injure any brush if treated as directed nor will it affect the varnish laid on by it in any way.

In the buying of a varnish brush, cost is the one thing that should not be allowed to cut any figure. Only with the best varnish brush can the best varnishing be done. Too good a brush has never yet been produced where perfect work is expected from it. The brushmaker doesn't sell his best product for the price of the imitation thing. He doesn't have to, and it may sound strange, but it's true, that a brush that can be developed into a perfect finisher is cheap, no matter what it costs in reason.

TIMELY SUGGESTIONS INTENDED TO PROMOTE PAINT SHOP PROFITS

It would be hard to imagine any work coming to the paint shop, and which about this time of year is due to arrive, on which so much must be done for so little money as the repainting and touching up of sleighs and cutters.

In the country shop especially, where prices never do measure up to the standard, much, very much, will be demanded for little, very, very little. In undertaking such jobs it is well to bear in mind that cutters and sleighs are not exposed to such rigorous service, and paint and varnish destroying influences as are wheeled vehicles; at least not during their term of actual use. In storage, which is their fate during most of the year, and occasionally, as in the case of an "open winter" for the full year, they do, however, suffer many indignities.

Bearing in mind these facts may help us to come a little closer to making a profit on such work, because a reasonable inference is that there is no necessity for the use of the really high grade elastic coatings and varnishes, and in the matter of color we can economize, because many of the left-overs from fine work, if they have been carefully saved and kept nearly air-tight, will answer every purpose. The touch up and varnish job on any vehicle is always more or less distasteful to the painter, and, to most of us, the cheapest grade of it is more or less of a disgust.

Many colors, notably some of the multitudinous reds, possess the faculty of fading into something that it is a physical impossibility to match, and a dead waste of time trying to. These colors are mostly found on gear parts, and a man can color one of them throughout in less time than he can find all the spots and touch them, even if his color would be a perfect match, therefore unless "any old thing will do," the better way is to give the whole a coat of flat color with a binder of elastic gear varnish, which will retard drying for at least three hours, then re-stripe, and finish with a heavy coat of heavy bodied gear varnish.

Usually the body can be made to go with patching, but if badly faded and much patching is necessary, give a thin coat

all over, and at once wipe off over stripes, etc., with a piece of clean cloth. Ninety times out of a hundred one can do this and save all striping. When all the body has been done in this way, if some of the striping appears much blurred, take a clean rag and clean turps and run over every stripe to brighten it up.

A good quality of good gear varnish is all right on the body of any such job if enough is used and properly applied. No brush coat of varnish can ever make a nice job on such work, and probably the hardest work a varnisher could do would be applying such a brush coat and worrying to keep it free from brush marks. Of course, no man who understands his business and knows where the beauty and durability of a coat of varnish lies, will use a brush coat. All he can crowd on and make stay there is what he aims at, and nothing short of that means success.

The cleanliness of the job to start on, in this class of work, is something that deserves more attention and consideration than it seems to get. Where but one coat of varnish is to be used on a touch-up-and-varnish job, a clean finish is a hard thing to get. There are always crevices and places where all sorts of dust and dirt can hide, and no amount of coaxing seems able to effect their removal. They positively will not budge until they come into contact with a varnish brush, when, lo, out they come, and on to the panel they go. Better attend to such places separately with other than a varnish brush. A good plan is to go around these places with just coach japan, and a brush stiff enough to catch the dirt in just the same way that the varnish brush would. Don't neglect any suspicious looking places, and reckon mouldings, inclined to looseness, among the suspects.

The preparation of such surfaces with powdered pumice stone and water is a waste of time, not only the time consumed in doing it, but what must elapse in drying out also. Careful work with No. 0 sandpaper will answer every purpose, and any one ordinarily careful can leave as nice a surface with it as the job has any right to have. The greater the amount of skill that can be brought into action on this class of work the more certain will be the decent finish with the least possible expenditure of time and material. It's mostly a costly mistake to entrust such work to just any odd hand on the ground that "it don't amount to much anyway."

Where a surface is cracked and needs making good it can, after being well sanded with at least No. 1½ paper and properly dusted off, be given a coat of a mixture of dry lead and keg lead in the proportions, say, of three-fourths of the former to one-fourth of the latter mixed to any consistency in half and half quick rubbing varnish and coach japan. This, when dry, will sand nicely under No. 1 paper which may be followed by No. ½, and again by No. 0, the follow up system being used to get a fine surface if needed, just in the same way as rubbing brick may be used on roughstuff in the early stages and the finish be made with lump pumice stone.

It may appear to some like a waste of time to use different grades of sandpaper, but a little practice of the plan will prove that it is not, and that if you wish to get such a surface as No. ½ can give, you will reach it quicker, with less material, and much more certainty to commence with No. 1. The lead mixture recommended is, to all intents and purposes, a putty. Just according to the condition of the surface to be treated should it be used, thinly so as to be laid on with a worn and somewhat stiff bristle brush and then knifed over so that all checks are filled, or be made stiff enough to work at once as glazing putty in cases of severe checking, or stiffer yet as hard stopping for holes and bad places generally. Of one thing be certain, that when adding thinner to the pigment the thinner is always the same, that is, equal parts of quick rubbing varnish and japan.

A good plan is to have, say, a quart bottle and put a pint of each in. The same thing should be done with every other mixture of diluents needed in the shop; guess work can work

much havoc on a nice surface. For use with a brush, add a little turps, just as little as possible. As glazing putty under the knife it should spread so as to leave the knife freely and adhere firmly to the surface. The quality of the leads used has much to do with its knifing qualities, and it may be some times necessary to add a few drops of oil, in which case it will need a little more time to dry. When thoroughly dry and sanded level, proceed to color out and finish to suit the grade demanded. A much nicer job can be gotten, if one can afford to do the work, by applying over the knifing putty a coat of roughstuff and rubbing out closely with either brick or pumice stone instead of sanding.

OLD HAND PROCESS OF PAINTING MOST LASTING

"Since the mechanical development of the motor car has reached its present high standard, the public has turned a more critical eye on workmanship and exterior refinement," says C. A. Pfeiffer, vice-president and assistant general manager of the Chalmers Motor Co.

"Body finish has been one of the most perplexing problems that the automobile maker has had to face. It was simple enough to obtain a glossy finish that would shine like a mirror while the car was new, but the difficulty came in securing a finish that would be lasting. While the finish of an automobile must be as fine as that of a grand piano, it must also be able to face every weather condition. Rain and mud must not mar it. It must be able to undergo long tours and then come out of its bath in the garage as bright and shiny as ever.

"On the early models, automobile builders had hundreds of complaints from cases where the paint had bleached or peeled. One trip over a bad stretch of mud road was often sufficient to mar the car's appearance forever.

"Experience has taught Chalmers body designers that while the dipping and baking processes of painting are much cheaper and simpler, they fail to stand up under the ordeals of inclement weather. Their long quest for the 'right' way has convinced them that there is but one satisfactory solution to the problem. As a result all Chalmers bodies are hand finished.

"Under this process, the finish becomes literally a part of the body, and not merely a surface coating."

Before a Chalmers body is ready for final inspection it undergoes 21 processes in the paint shops.

LEGIBILITY OF COLORS

Red is a showy color, but which colors are most invisible, is the problem the army authorities try to discover. Advertising people want the very opposite. You have often wondered what color to paint a small sign that would advertise goods at the greatest distance. Here is the comparative legibility of ten color combinations. One hundred persons participated in this test, the average distance at which the lettering was readable by each was noted. The signs and the lettering on the signs were the same size in each combination of color:

Black on yellow.....	375 feet
Green on white.....	367 "
Red on white.....	364 "
Blue on white.....	364 "
White on blue.....	357 "
Yellow on black.....	352 "
Black on white.....	351 "
White on red.....	350 "
White on green.....	341 "
White on black.....	340 "

POISONING BY AEROPLANE VARNISH

The enormously increased production of aeroplanes during the war lends point to a warning regarding the varnish employed. At the aeroplane works in Johannisthal a number of workmen employed in the varnishing department were taken

seriously ill, and two deaths resulted. The most important symptom was jaundice due to decomposition of the blood. On investigation the cause was found to be poisoning by tetrachlorethane, the only solvent known for the highly combustible acetylcellulose. These accidents led to an order forbidding the use of solvents containing a high percentage of tetrachlorethane.

THE CHOICE OF A BACKGROUND

We were recently shown a photograph of a boat-shaped motor body, which was not only outlined after the fashion of a boat, but was finished in every possible particular on nautical lines. The effect, however, of the whole was considerably enhanced owing to the fact that the car had been photographed on the banks of the river—just the stream in which one would imagine the craft would sail had it not been designed for use on land. The choice of a background when photographing a motor car is a matter upon which the professional photographer usually spends a considerable amount of care. The busy carriage builder, says the *Automobile and Carriage Builders' Journal*, anxious to obtain a record of the job just going out, snaps the car up against a convenient shed or wall without much trouble as to the artistic effect as a picture, and sometimes even the question of distortion is disregarded. The same car, had it been handed over to a professional man, would probably have been driven a short distance away so that it could stand in front of a well known picture gallery or museum famous for its architectural beauty, so that the customer who looks at the photo is apt to consider the car as fine a specimen of its class as the building before which it stands. The choice of a background is simplified if the car is able to be photographed in the early morning, before the small boy is about, or the traffic of any volume.

In looking through various catalogs one may also notice the same care taken in the choice of a background. Town carriages are taken in front of a mansion in Belgravia, a touring car in a pretty lane, while it is often possible for good pictures to be taken of colonial models in an appropriate "back of beyond" atmosphere. If there is no time to choose a proper background, it is just as well to obtain assistance so that a couple of men can hold a sheet up at the back of the car. This is more satisfactory than having the background afterwards taken out on the negative. Photography, considering its utility, is not an expensive process, so that nothing smaller than half-plate size should be utilized even for reference purposes. The majority of firms, it may be stated, use the full-plate size, and it must be admitted that the skilled photographer, who has had plenty of experience in photographing cars, turns out an excellent picture with a wealth of clearly defined detail.

TANNERS ASSOCIATION TO HAVE RESEARCH LABORATORY

At the recent meeting of the National Association of Tanners it was voted to recommend a budget for 1915-16 of Proposed Investigation and Research Division of the Tanners' Institute.

It was proposed that the Research department be conducted at Pratt Institute, Brooklyn, N. Y., in connection with the Tanners' Institute. The estimated total yearly expense has been figured at \$12,000.

The circular issued by the National Association of Tanners regarding the Research Laboratory, should be in the hands of every leather manufacturer in the United States and Canada. The better and more widely known, so much the easier will it be to raise a sum large enough to form a sort of endowment fund, the interest of which will assure the perpetual establishment and growth of the enterprise.

It is estimated that 1,500 square feet of floor space would be required. The laboratory may be installed in the chemistry building of Pratt Institute, or in one of the adjacent high grade factory buildings. Four years ago Pratt Institute expended about \$4,000 for the extension of its school tannery, and contemplates a further outlay of about \$7,500 for the proposed

transfer of the school tannery to the basement of the chemistry building, and its reinstallation on an enlarged and improved plan, including considerable new equipment.

The National Association of Tanners has contributed about \$5,000 to \$6,000 each year toward the support of the Tanners' Institute, and its expanding activities. The salaries of instructors and all the large overhead expenses have been borne by Pratt Institute, which, while it charges a nominal tuition fee, draws heavily upon its permanent endowment fund income for the support of these special courses of instruction.

The National Association of Tanners has decided to contribute \$12,000 a year for five years, representing a total of \$60,000, toward the research laboratory. This is in addition to the minimum of \$3,000 annually contributed to the Tanners' Institute by the association. Altogether \$15,000 per year must be provided for the next five years by the National Association of Tanners.

TRUCKS TO REPLACE TUBES

Government to Abandon Pneumatic Service in Large City Postoffices

The contract of the postoffice department with the American Pneumatic Service Co. for the use of the pneumatic tubes through which mail has been distributed to branch postoffices in large cities is not to be renewed. After this year the work will be done by motor trucks.

The American Pneumatic Service Co. installed its first service in Boston in 1901. It laid tubes under the street through which carriers were forced by compressed air at high speed from the main to the substation postoffices. Each carrier was about eight inches in diameter, rolled on wheels, and carried about 20 pounds of mail.

After this system had been tried in Boston similar services were established in New York, Philadelphia, Cincinnati, St. Louis and Chicago. The government did not own the system, but it was put in by the company on a rental basis extending over 15 years.

Since the parcel post distribution was inaugurated packages of such size that they cannot be sent out in the carriers have been handled in large quantities. Considerable time also was required in the postoffice to load the carriers properly, and whenever a leak developed in the tubes much annoyance is often caused before they can be cleared and again be put in commission.

During the period since the system was inaugurated the motor truck has been developed and practically perfected. It has now been found that it is both cheaper and quicker to carry the mails by truck rather than by tube. Careful packing is unnecessary.

The decision to replace the tubes with trucks follows decisions dispensing with trolley service in many cities, so that it is evident in the view of postoffice experts that the motor truck is the most efficient means of mail distribution and its use in large numbers can be expected in all of the larger cities of the country. In many cases, too, the government is buying the trucks instead of depending on contractors to furnish the service.

GOBRON, FRENCH CAR MAKER, KILLED

Jacques Gobron, one of the partners in the Gobron Automobile Co., of Billancourt, near Paris, is reported killed in an aerial fight with a German machine. He held the military rank of lieutenant and joined the French air forces at the outbreak of war. Jacques Gobron was responsible, with his brother Jean, for the Gobron automobile factory, their father, Senator Gobron, having died a couple of years ago. The company was very prominent, in the early days of the industry, for its double-piston motors.

DEALERS PRESENT HUGH CHALMERS WITH LOVING CUP

With the presentation of a gold loving cup to Hugh Chalmers, the most important and best attended sales convention in the history of the Chalmers Motor Co. was brought to a close Wednesday, November 17. Over 600 Chalmers dealers traveled to Detroit from all sections of the United States and Canada.

For the first time in the history of the automobile business, a motor car company had actually placed a new car on a ~~quantity~~ production basis, before announcing it to the dealers of public.

The presentation of the solid gold cup to Mr. Chalmers came as a climax to Wednesday evening's banquet at the Detroit Athletic Club. Mason B. Hatch, Buffalo dealer, made the speech of presentation and fittingly expressed the warm personal admiration and regard felt for Mr. Chalmers by members of the dealers' organization.

Standing out as the keynote of this year's Chalmers convention was the single word "Preparedness." From the time the dealers left the Michigan Central Terminal on their arrival in Detroit until they took the train for home, they were in the hands of an efficient organization which looked after every feature of comfort and convenience.

The convention opened Monday morning with an address of welcome from Hugh Chalmers. Talks followed on the Chalmers organization by Vice-president and Assistant General Manager C. A. Pfeffer and Vice-president in Charge of the Selling Division Paul Smith. The morning session marked the formal opening of the new Chalmers auditorium at the factory, seating 600 people.

Following lunch in the factory restaurant, the big surprise of the day and the convention was given the dealers. Taken through the factory grounds presumably on a tour of inspection, the 600 visitors turned the corner of a building to gaze at over 200 cars of the latest Chalmers six-30 vintage. The dealers spent a busy half hour inspecting the motor, equipment and refinements on the car, after which they were asked to get in the cars for a trip around the city. Led by a platoon of mounted police and a brass band, the delegation toured the principal streets of Detroit.

After returning to the factory, the dealers again assembled in the auditorium where in the short space of 40 minutes, over \$22,000,000 in Chalmers cars were ordered.

Monday evening the dealers were guests of the company at a dinner in the Hotel Pontchartrain.

Business sessions occupied the time of the dealers through most of Tuesday. In the afternoon, Isaac F. Marcossan talked on the subject of "War and Salesmanship." Mr. Marcossan drew some interesting comparisons between the preparedness of Germany and the unpreparedness of England at the start of the European war and issued a message of warning to American manufacturers to be prepared to hold the advantages gained during the war.

Tuesday evening's dinner was a gala affair at the Hotel Statler, where all ceremony was abandoned in favor of a Mardi Gras style of entertainment. No knives or forks accompanied the beefsteak dinner and the guests reverted to the natural methods of eating. The dinner was entitled "A Night With the Animals" and proved one of the biggest hits of the convention.

On Wednesday, Chief Engineer C. C. Hinckley spoke on the relation of sales to engineering, and went into detail on the refinements of the new six-30. Service Manager H. W. Miller discussed service plans and Assistant Sales Manager F. B. Willis talked on the Chalmers selling organization. Advertising plans were gone into by Advertising Manager Gail Murphy, who advised the dealers of an extensive advertising appropriation for the coming year.

The final banquet of the convention was held at the Detroit Athletic Club, Wednesday evening.

STARTING AN AUTOMOBILE BY WIRELESS WAVES

For the first time in the history of the automobile, it has been demonstrated that a car can be started from a distance by wireless wave control. The demonstration occurred at the Indiana State Fair, where the engine of an automobile was started every five minutes by wireless waves sent out from a station in Indianapolis, five miles away.

The complete wireless transmitting equipment consisted of a motor-generator, transformer, condenser and the necessary tuning apparatus, all of which were installed in a show window of a local automobile dealer. The transmitting set was connected with an aerial erected on the roof of the building.

The automobile on exhibition at the fair grounds was equipped with a receiving apparatus and the necessary relays and automatic switches for throwing on and off the electric current of the self-starter and magneto. An automatic switch was provided so as to allow the car to run for 45 seconds, after which the magneto was cut off, bringing the car to a stop. As before stated, the operation of starting the car was repeated at five-minute intervals.

One of the most interesting features of the experiment was the fact that the entire operation of starting the car was accomplished without the aid of a human hand; a time switch, installed in connection with the wireless transmitter in the city, controlling the entire operation. From the time Governor Ralston, of Indiana, placed the car in operation for the first time by pressing a key at the transmitting station, until the last day of the fair, the starting and stopping of the car was accomplished automatically.

WORKING WOOD BY THE APPLICATION OF HEAT

It is often desirable to fit a piece of wood into a piece of metal by means of cutting a thread in the metal and screwing the wood therein. This can be accomplished, says Popular Mechanics, by heating the metal to a little over the boiling point of water, and screwing the wood piece into the metal while hot. Or, if this is impracticable on account of size, to heat the metal, make a screw plate by cutting a thread in a small piece of metal, the size and thread corresponding to the hole into which the wood piece is to be inserted, and heating it to the required temperature, then running the wood with some pressure through the thread. The wood then can be screwed into the larger piece, when it will hold firmly. The process of heating wood without the aid of steam can be used to advantage in a number of ways; for instance, a hammer handle that is crooked can be straightened by careful heating without burning; also billiard cues, or almost anything of hard wood. It is surprising how easily it is done and how permanent the repair will be. The Indians at one time made their arrows from small hardwood twigs which were almost always crooked to start with, but after being dried they were warmed over a fire and straightened. Another use for the application of heat is as follows: When it is desired to place a screw in a fragile piece of wood that is likely to split, if the screw is heated to a blue color and turned into the wood while hot, there will be scarcely any danger of splitting. In this case do not try to use oil or a lubricant of any kind, as the screw is sure to set before it is in place.

HAVE THREE YEARS TO SETTLE

M. Henry Lane, former chairman of the board of directors of the defunct Michigan Buggy Co., of Kalamazoo, Mich., and Frank B. Lane, Sr., president of the company, have been given three years to make a settlement with their creditors. It is understood that 80 per cent. of the creditors agreed to a settlement out of the court.

MANUFACTURER AIDS CENTRAL STATION IN SELLING ELECTRIC VEHICLES

By A. Jackson Marshall, Secretary Electric Vehicle Association of America

Co-operation! One of the hardest worked, most abused, least understood words in the English language. Co-operation has a thousand different shades of meaning to suit the advantage of proposers. Ofttimes co-operation does not advance far beyond the conversational stage. On the other hand, co-operation is successfully practiced extensively, but does suffer greatly from the selfish or negative attitude of pseudo-practitioners.

Fortunately, in the electric vehicle industry, and especially recently, co-operation is being practically applied, perhaps not so extensively as we would all like, but nevertheless, there are definite active co-operative movements made possible largely through the Electric Vehicle Association, which give promise of an irresistible, concerted movement which will establish for the electric vehicle merited supremacy.

There are many central stations, manufacturers and others, who have evolved definite bases of profitable co-operation and it will be the pleasure of the Electric Vehicle Association to publicly indicate these plans from time to time in order that interested parties on two sides of the problem may be the more speedily placed in effective contact. The Electric Vehicle Association requests that it be informed of co-operative plans for further dissemination.

The writer recently interviewed F. S. Komp, general manager of The Lansden Company, Brooklyn, N. Y., regarding the "Lansden selling plan." Mr. Komp's outline of the means being employed by his company to really co-operate with central stations is extremely interesting. He says in part:

"The 'Lansden selling plan' consists of our placing a demonstrating car with a central station and co-operating with them, both in the demonstration and the closing of any business which they may develop, and accepting deferred payments where necessary, running over a period of one year, the notes being given by the customer, to the central station, who will turn them over to us, the central station, however, assuming the responsibility of the collection. The battery is to be handled in like manner, or on a rental basis, as agreed. If ten cars are sold during the period of the campaign the central station is made a present of the demonstrating car. In addition thereto, a cash commission of \$50 is paid to the individual salesman who secures the order for the vehicle.

"The central station's part is to work up a volume of prospects preceding the demonstration. Which is supplemented by advertising in the local papers, coupled with a series of letters sent out at intervals of a few days each. The cuts and the 'copy,' also folders, will be supplied by us. The central station, of course, would be expected to enter into this matter enthusiastically and put all of their force to work energetically in the development of the vehicle business during the period of the campaign. They will also co-operate with a competent garage, so that the cars will be properly and economically taken care of.

"We have endeavored to develop a plan which would make it unnecessary for the central station to invest in demonstrating equipment, but at the same time give them the benefits of the sale of the vehicle. The period of the campaign, together with many of the details of it is subject to change to suit the local conditions."

FORD PLANS EASTERN FACTORY AND BEGINS THREE MORE ASSEMBLY PLANTS

The Ford Motor Co. has purchased a tract of 80 acres near Newark, N. J., upon which a large eastern plant will be established.

Newark has excellent railroad facilities which appealed to

Mr. Ford more than anything when he visited that city last summer. It is stated that Mr. Ford has not been satisfied with the railroad facilities in Detroit and has been desirous of building an eastern plant where a big saving in freight rates can be made. Added to this the export trade of the company can more easily be taken care of by means of an eastern plant from which its cars can go direct to the docks.

The company is also adding three more links to its chain of service and assembly plants located at important points throughout the country. The latest additions are at Milwaukee, Omaha and Oklahoma City, which will be ready for operation early in 1916. Their combined cost will be \$990,000.

The assembly plant at Milwaukee, which will have a capacity of 75 cars a day and employ about 400 men, will cost \$385,000 and will be open for business about February 1. The Omaha plant will cost \$375,000, will supply 400 men and have a capacity of 75 cars a day. The assembly plant at Oklahoma City will cost \$230,000, will employ 300 men, will assemble 40 cars a day at the start and will later increase that output to 60 cars a day. It will open about May 1.

These three new plants, modern in every respect and designed and built according to a uniform plant adopted by the Ford company, bring the total number of such assembly plants to 28.

NOVEMBER MEETING OF CINCINNATI CARRIAGE MAKERS' CLUB

The November meeting of the Carriage Makers' Club was held November 11 at the Business Men's Club with 39 members present, four guests of club and one guest of member.

In the absence of President Perrine, Chas. A. Fischer presided. The minutes of the October meeting were read and approved.

The membership of the late F. H. Rose, of The Valentine Co., was transferred to T. A. Knight.

The transfer of membership of Wm. F. Osmer, of the Cambria Steel Co., to J. L. Adams, of the same company, was read and approved.

Vice-president Fischer then introduced the speaker of the evening, W. C. Devereaux, our local forecaster, who entertained the members with stereopticon views, explaining the peculiar actions of the atmosphere. He also explained the weather maps, the meaning of the lines showing the traveling of the storms, etc.

Dr. Frankfield, chief forecaster of the United States, addressed the members, explaining the importance of the Weather Bureau to the public in flood centers, also the importance and the help given shippers of perishable goods and also the assistance given the people in the fruit-growing districts.

The members enjoyed the stereopticon views and talks of Messrs. Devereaux and Frankfield. A rising vote of thanks was given these gentlemen, also Mr. Huber, who furnished the machine and his services free of charge.

The meeting adjourned at 9 o'clock.

PARRY CO. TO BUILD COMMERCIAL BODIES, TOPS AND TRAILERS

The Parry Mfg. Co., Indianapolis, Ind., manufacturer of horse-drawn vehicles, has developed a line of commercial bodies for automobile chassis, as well as two models of trailer and a variety of tops of all styles. The chief activities of the company in its commercial body line have been directed toward designs for the Ford chassis, although bodies for other makes are not to be neglected. The trailers are a two-wheeler and a four-wheeler, the connection provided being an adaptation of the Bradley coupler, permitting a straight pull on both ends of the axle that adapts itself to the motion of the vehicle to which the trailer is attached. These new lines will not interfere in any way with the manufacture of the company's horse-drawn vehicles.

REORGANIZE OFFICIAL CLASSIFICATION COMMITTEE

Reorganization of the Official Classification Committee, which handles general classification questions east of the Illinois-Indiana state line and north of the Ohio River, has been announced by the carriers serving that part of the country. The reorganization, which became effective December 1, follows the lines adopted in Western Classification Committee territory a few years ago. The unwieldy committee of large membership, meeting two or three times a year, gives place to a committee of four members who will devote their entire time to classification matters.

The membership of the new committee is as follows: R. N. Collyer, chairman; J. W. Allison, who comes from the Baltimore & Ohio Southwestern; D. T. Lawrence, of the Central of Vermont, and F. W. Smith, of the Committee on Uniform Classification. These men will have their headquarters at 143 Liberty street, New York.

In the old days, a classification committee had a permanent chairman, but the personnel of the committee itself was shifting as member railroads would detail various traffic officers to attend the semi-annual meetings. Petitions for changes, several hundred in number, would be allowed to accumulate through the time the committee was not in session and then attempt would be made to dispose of the matter at one session which might last days or weeks. No shipper knew just when his subject would be reached.

The reorganization of the Western Classification Committee, where the membership was reduced to three, blazed the trail. Hope is now expressed by shippers that the southern lines will follow suit. The only drawback to the Official Classification Committee change, from the standpoint of western shippers, lies in the probable abandonment of the custom of holding preliminary hearings at Chicago. In the future, western shippers will undoubtedly have to go to New York to present pleas for changes in the eastern classification.

HORSES' INDIFFERENCE TO SHELL FIRE

Percival Phillips in a letter to the London Daily Graphic, writing from the British headquarters in the field, near Ypres, says that horses appear absolutely indifferent to shell fire.

I have seen plowmen—and plowwomen driving them down a furrow a few hundred yards from bursting shells, and they did not show the slightest concern. The other afternoon I stood at a certain observation post and watched the German high explosives. Shells sang wickedly across the fields. Down a country lane came an old farmer and his horses, tramping stolidly to the little wooden stable as they had done for years at the close of day. They never looked up at the sunset sky when a British aeroplane was also wending its way home, with balls of shrapnel smoke floating in its wake, or paused to regard the greater bombardment just beyond the next farm. The farmer—and doubtless the horses as well—knew the set program of the day, and it did not trouble them at all. One can become accustomed to anything—even to German shells.

PEERLESS JOINS GENERAL VEHICLE

The Peerless Truck and Motor Corporation has been formed and has taken over the business of the Peerless Motor Car Co. and the General Vehicle Co., which is a subsidiary of the General Electric Co. Since 1912 the Peerless company has been controlled by the Terry, Tremaine and Crouse group of Cleveland capitalists, who developed the National Lamp Co., which manufactured about 60 per cent. of the incandescent lamps sold in the United States until the business was bought by the General Electric Co. This deal means that they have disposed of their motor car interests to the same people that took over their electrical business. The new company is capitalized at \$15,000,000. It is understood that Peerless common stock was

taken over for \$175 in cash and \$50 in bonds of the new corporation. Peerless preferred stock went for \$103 in cash. Peerless common, which was selling as low as \$10 in October, 1914, thus brought \$225 to its owners.

There is no change in the management either of the General Vehicle Co. or the Peerless Motor Car Co., which will be continued as separate subsidiary concerns. The control of both now rests with the General Electric group. The Peerless Motor Car Co. is reported to be about to bring out a new eight-cylinder car, which will sell for between \$1800 and \$1900. A new two-ton truck will also be built. L. H. Kittredge, B. G. Trémaine and F. S. Trrey will represent the Peerless wing of the company on the general board of directors.

HIGH FINISH IS EASILY DAMAGED

Methods and materials for finishing the bodies and running gear of motor cars have been brought to a high state of perfection, but it is well to remember that there are certain abuses, against which no finish, however perfect and durable, can long endure.

No varnish will endure being scrubbed with a brush, or with hot water. No varnish will withstand the chemical action of ammonia or any kind of lye soap, nor any of the common washing fluids or powders. No varnish will stand having dust or mud rubbed off, nor will it endure the grits of dust and mud driven into it by the water blast from a high pressure hose, to which it is often subjected.

Use water at 60 degrees or lower and a soft clean cloth or sponge. It is best to use no kind of soap unless it be pure castile. Mud, wet or dry, should be removed with flowing water squeezed from a clean sponge or flowing from a hose with very little pressure—never with a water-blast.

When not in use keep the car covered with a soft-lined cover. All dust contains grit and all smoke contains acid, and against these, a cloth cover offers adequate protection.

However well varnish has endured our weather testing, it may be seriously affected by instant extremes of temperature. A glass dish may be filled with boiling water (slowly) without cracking it and may be filled with ice water (slowly), but it will invariably crack if plunged instantly from boiling water into ice water, and vice versa.

THE QUESTION OF WEIGHT

Although the cyclecar is practically defunct, its brief career in this country brought out one point very strongly—that a car can be built too light. Besides being difficult to properly balance, and holding the road badly, a light construction quickly affects its own destruction, for the excessive vibration of every part makes it impossible to keep joints tight, and with the loosening of joints the whole structure is soon wrecked. Of course, it is easy to go to the other extreme; but the moral of the story is that too much engineering skill cannot be put into every part of an automobile to ensure stiffness and durability, without excessive and unnecessary weight.

AT THE PACKARD PLANT

The Packard Motor Car Co. now employs 10,179 persons in its plant at Detroit, Mich. More than 500 of this number have been added since November 1, and the employment department is still working at top speed, hiring men to supply the demands for workers in nearly every division of the factory. In October the incoming material comprised 477 carloads and 3,273,560 pounds in less than carload lots. The payroll for October was \$773,879; for November it will be considerably more than \$800,000. The company has an extensive welfare department, operating night schools for foremen and assistant foremen and a school for apprentices, who are trained to become foremen and expert mechanics.

ECONOMY AND ENDURANCE OF GOOD PAVING

In view of the excellent results which many states are securing from the construction of brick roads, the United States Department of Agriculture has issued an exhaustive bulletin giving general information for public officers who have charge of pavement construction.

Brick roads, the bulletin states, have three important advantages. They are durable under all traffic conditions; they afford easy traction and a moderately good foothold for horses; they are easy to maintain and cheap to clean. The chief disadvantage is that they are more expensive to construct, and in many cases the effort to reduce the high first cost has led to the construction of inferior pavement.

The cost of brick pavement depends upon factors so variable that no effort is being made to give approximations, but instead a formula is suggested by which cost can be estimated when the price of material delivered to the job and of labor are known.

The bulletin discusses the different kinds of material from which brick are made, the manner in which these are taken from the earth and the processes by which brick manufacture is carried on. It describes, too, tests that can be made of brick to be sure of their quality.

Among the qualities that good brick must have are uniform size, reasonably perfect shape, toughness or resistance to crushing, hardness or resistance to abrasion, and uniform grading, that all parts of the pavement will wear at about the same rate. The crushing strength of good paving brick varies from 10,000 to 20,000 pounds the square inch, but since they are seldom subjected to stresses of greater than about 2,000 pounds, this is of small consequence.

The most important trial for quality of brick is what is known as the rattler test. In this the bricks are subjected to destructive influences similar to those they have to withstand in actual use, and the effects resemble those which traffic may be expected to cause upon the completed pavement. The test is made by enclosing ten dried bricks in a steel barrel with a number of cast iron spheres. Ten of these spheres weigh $7\frac{1}{2}$ pounds each. Enough smaller ones weighing a little less than a pound are added to make the total weight approximately 300 pounds. The barrel is then revolved at the rate of 30 revolutions a minute for an hour. At the end of that time the bricks are taken out and weighed and their loss in weight during the test is ascertained. In this test a good paving brick will lose from 18 to 24 per cent. of its weight. In drawing specifications for brick for a road, it is desirable to fix the minimum as well as the maximum loss of weight from a sample by this test to insure against too great a difference between the softest brick that may be acceptable and the hardest that may be supplied.

The four essentials of a good road bed on which the brick are to be placed are good drainage, firmness, uniformity in grade and cross section, and adequate shoulders. Where drainage can be obtained in no other way it may be necessary to lift the road considerably above the surrounding land.

If the ground has been properly drained firmness is secured by making certain that the road bed is thoroughly compact. The sub-grade must be repeatedly rolled and reshaped until the desired grade is secured. The shoulders should never be less than four feet wide and not infrequently one shoulder is made sufficiently wide to form an earth roadway parallel to the brick pavement. Strong curbing is necessary for all brick pavement to prevent marginal brick from becoming misplaced. Portland cement and stone are the best materials for curbing.

Unless the foundation is evenly firm, some of the bricks will be forced down below the others. If the traffic is light a foundation of crushed stone, similar to that used for macadam, may be used, but if heavy traffic must be carried a concrete base is necessary. Above the concrete base a sand cushion

$1\frac{1}{2}$ to 2 inches thick is used to compensate for inequalities in the surface of the concrete and make the brick surface level.

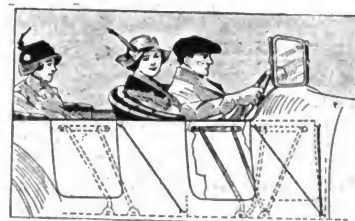
This should be clean, dry sand, and should be gone over carefully to remove all undesirable material. Bricks are laid upon it and rolled with a steam roller. Joints between the bricks are filled with some material such as a grout made from Portland cement and sand, which will prevent the edges of the brick from chipping.

On top of the pavement a layer of sand should be placed to prevent the grout drying too rapidly and the road should be kept in that condition, closed to traffic, for ten days. To prevent the pavement being noisy expansion cushions made of layers of bituminous materials should be placed along the curbs.

Brick pavement in America has hitherto been used chiefly for city streets, the first having been laid in Charleston, S. C., in 1872. The early work was usually improperly laid and did not have long life. Exceptionally fine results from a great many brick pavements in various parts of the country prove, however, that this paving is very enduring and economical if properly laid.

HINGELESS MOTOR-CAR DOOR DISAPPEARS WHEN OPENED

Instead of swinging outward into the path of passing traffic when opened, a motor-car door, for which patent rights have just been issued, slides into the hollow space between the double walls of a vehicle body, disappearing from view. One of the advantages claimed for the device is that a lateral pres-



The motor-car door disappears when opened

sure upon it cannot cause it to open. It employs neither hinges nor locks and operates automatically by pressure on a release button. The door is hung on a pair of bars which are pivoted to the upper portion of it and to an angle plate fastened within the wall pocket. When in either an open or closed position it is held in place by its own weight and prevented from rattling by the tension of a spring.

TESTING TRUCKS FOR WAR USE

How rigorous are the tests for motor trucks submitted to the French government may be judged from the following description of a typical "try-out" to which the trucks are subjected soon after being taken off the ships. Two drivers are put on each vehicle, which is sent to the front as part of a convoy of 20. Each convoy is in charge of a lieutenant in a touring car. One of the trucks is fitted out as a repair shop, while another carries the cooking stove and kitchen outfit for the men. The convoy is sent over the hilliest and toughest country (not roads!) in northern France. The four-wheel-drive machines, of which an ever-increasing number is now used, are compelled to go through a ditch so deep that there remains a clearance of but a few inches at the front, when the rear is elevated. No "green" driver can possibly get by, in such a test, while the work is so strenuous for the trucks that a great many fall by the wayside. One of the first trucks subjected to the ditch test broke the starter handle clear off—in the bottom of the ditch—showing at what a steep angle it was driven.

BETTER VALUES IN CARS AT SHOW

In Spite of Increased Cost of Raw Materials the Manufacturers Are Giving More for the Money Than Ever Before

"While it is true that the war has brought about certain conditions in the automobile industry which to a certain extent have hampered the manufacturers of motor vehicles, nevertheless the buyer of a 1916 car will get more for his money than ever has been the case in the past," says C. E. Duryea, technical expert. "The sixteenth National Automobile Show, to be held under the auspices of the National Automobile Chamber of Commerce at the Grand Central Palace from December 31 to January 8, will emphasize this fact.

"While it is true that the demand for steel, copper, iron and other materials to be made into munitions has raised the price of raw material and brought about conditions making it difficult for motor car manufacturers to obtain delivery of the raw or partly machined material, nevertheless such remarkable strides have been made in other directions that this extra expense is more than compensated. The majority of factories have recently installed much new labor saving machinery and in increasing their outputs have been able to produce better cars or better parts at lower cost, even though the cost of the raw product has come somewhat higher. The parts makers are able to deliver complete assemblies far more expeditiously and cheaply, and of better quality in many cases, than heretofore. Never in the world's history has there been such a popularizing of a complicated structure as that which the automobile industry has given us; never before has such a multitude of improvements been crowded into a few short years, and even a few short months.

"Fifteen years ago the first automobile show was held in New York City in an effort to popularize and introduce the toddling infant industry to the great public. The pet of the public at that time was the little steamer which whizzed along the best roads in an admirable manner in spite of the fact that the complicated mechanism, which completely filled every available space, weighed so much that the wire wheels actually wobbled. There was a wait of a few years and the gasoline vehicle began to come into its own.

"Having passed through the days when the single cylinder developed into the double cylinder and later became the familiar four cylinder type, then increased to six, and more recently to eight and twelve cylinders; having been through the mill of various sorts of transmissions, several kinds of ignition and numberless other vital things, the car of 1916 represents the most remarkable mechanical development in two decades. The best brains in the world are at the command of the buyer, and they produce for him such a structure as was not thought possible when the industry started.

"Splendid factories filled with the best designed machinery ceaselessly grind out parts that for exactness, proportion and quality of material never have been seen before. They are built in such a manner that they last longer. The upkeep and repair expense is less to the buyer, so that he not only gets more for his money in the initial investment but he is the one who gains in the matter of upkeep. The machine has succeeded the man until intelligence seems to be all it lacks, and this the man supplies to the machine."

No Show Space Left

Not an inch of space is left for car exhibits at the show, a condition which has never existed before at so early a date.

The show will be not only the largest motor car exhibition in the world to be held under on roof, but it also will be the first display of all that the American car makers have to offer for 1916.

Despite the fact that motorcycles will not be shown at the Palace show, the floor space usually occupied by cycle makers has been allotted. To date only five accessory spaces can be had, and these have been applied for.

TO STANDARDIZE LICENSE PLATES

While the laws of most states are substantially in agreement in requiring the use of a stipulated form of license plate, their varying interpretations of the necessary conditions is distasteful to automobile makers, for reasons that are obvious. Recognizing the need of harmonizing such minor differences in the plates as have no particular bearing on the legal requirements of the license question, the Society of Automobile Engineers is just concluding an extensive investigation of the subject and at its forthcoming winter meeting in New York City, January 5 and 6, will offer for acceptance by the authorities a standard form of plate that will be of primary benefit in enabling the makers to equip their cars with standard license plate brackets that will be adapted to receive the regular plate prescribed by the laws of any state. The motorist thus will be enabled to attach new plates to his car in a secure and permanent manner, as soon as they have been issued by the authorities; while the provision of standard brackets will also give assurance to the authorities that the plates will not only be securely attached but will be mounted conspicuously and properly illuminated at night.

Many different sizes of license plates are now in force, while of the many sizes and styles of lettering employed, some are easily readable under ordinary conditions, while others are practically illegible, even under favorable circumstances. From its investigations, lasting nearly two years, the Society of Automobile Engineers finds no practical reason for the existence of any material difference in the license plates of various states save such distinguishing marks as may be necessary for state identification and the year of issue. The former requirement can be readily taken care of by means of a symbol of abbreviation for the name of the state, while simple color schemes, such as are now generally employed, entirely satisfy the latter requirement. Accordingly the society will in all likelihood adopt the policy of calling the attention of state legislators to the advantages of legalizing a plate of maximum legibility and of a size that is not excessive, practically recommending to their attention a standard style and size of license plate.

ENGINEERS TO MEET DURING WEEK OF AUTO SHOW

The annual midwinter meeting of the Society of Automobile Engineers is to be held in New York City, January 5 and 6, during the week of the Automobile Show in Grand Central Palace. By condensing the program into three sessions it is planned to afford ample opportunity for the visiting engineers to study the displays at the show, while taking full advantage of the formal papers and discussions that will comprise the principal work of the society. Selection of subjects and speakers has been made with special reference to the immediate needs of the automobile makers just at this time, and in view of the unusual conditions surrounding the industry this year, while the work of the Standards Committee will bring to the attention of the members matters of great concern in effecting manufacturing economies. The meeting will be concluded by the annual banquet, which is to be resumed after a year's intermission, and which has been announced for Thursday evening, January 6, at the Hotel Plaza.

SHOWER BATHS FOR HORSES

Shower baths for draft horses are a new innovation adopted by some of the larger cities where a great deal of heavy teaming is done in the hot weather. Through arrangements with the local fire departments the humane societies have received permission to attach a hose and spray to the fire plugs at certain corners so that teamsters and others may stop and give their horses a bath simply by turning on the spray attachment to the fire plug.

AUTO DEALERS URGE UNIFORM TIME FOR ANNOUNCING NEW MODELS

Since the convention of automobile manufacturers, when it was found impossible for makers to agree on a uniform date, on which to announce their new models, the various dealers' organizations have taken up the subject for consideration and discussion.

The Tri-City Automobile Trade Association, of Illinois, consisting of dealers in Rock Island, Davenport, and Moline, Ill., recently formulated a strong protest against the unwarranted use of the calendar, a protest which emphasized the fact that the present custom is injurious to the best interests of the dealer and manufacturer. The association protests against any change in present models before December 1, 1916, and recommends that the manufacturers agree among themselves to have a uniform time for announcement of new models which is not to be before December 1. or later than February 1. of each year. The special reasons given for such recommendations are:

First—Uniform time for announcement by all manufacturers will avoid disturbing the selling season by reason of buyers using the excuse of desiring to wait to see what some other manufacturer is going to do.

Second—That sample cars for sales room or demonstrator use should be in the hands of dealers before announcements are made, so that dealers can be benefited by the announcement and cars immediately seen by the prospective buyers.

Third—That factory organization and production can be brought to its height when the heaviest of sales and deliveries are made, being the spring and early summer months.

Fourth—That the dealers, who are really the manufacturers' sales organization, may know when to expect new models, concentrate his efforts on cleaning up his stock of old models and be prepared to put his energy into the new.

Some dealers the past year were badly stuck with quite a quantity of 1915 models on hand when the 1916 models were announced and also obliged to go out and sacrifice them at a considerable loss, because of the reduction in price of new models and the fact that the 1915 model was considered by the prospect as being out of date when the 1916 announcement was made.

Fifth—That it will give new life and energy during the dull period of the year to the dealer to make sales and have a tendency toward making the automobile business more nearly an all-year-round business, than a seasonable one as has been the condition in the past.

Sixth—That the National Automobile shows and the shows following will really be a "Fashion Show" of new models by all manufacturers, instead of the cars exhibited being from four to eight months old.

Seventh—That the dealer realizes he is dependent upon the manufacturer for his goods and that the manufacturer is dependent upon the dealer, which is his sales organization, and therefore interests are mutual.

Eighth—That the dealers all over the country are organizing into local associations, then into state organizations, and finally into national, with the purpose of raising the standard of the dealers that the manufacturer may be better represented by good, sound concerns, realizing that the marketing of automobiles and its accessories will hereafter be on more of an actual merchandising basis than has existed heretofore.

Another organization that has made protest to the National Automobile Chamber of Commerce against the unnecessary burdens thrust upon dealers and owners, is the Garage Owners' Association of Illinois. At their Peoria convention the members adopted the following resolution:

Whereas, The present conditions attending the premature announcement of new models of motor cars by the manufacturers, and the subsequent inability to make deliveries have involved the automobile dealers in material financial loss, and have continually developed the greatest confusion among dealers and purchasers of automobiles at a time of the year when sales and deliveries should be at the highest point, and

Whereas, These conditions result in a greatly increased overhead expense to the dealer in financing and storing shipments of automobiles during several months in the year, at the peak of factory productions, when sales are at the lowest point, to prepare for the first rush of the selling season, and

Whereas, A careful study of the problems presented has been made by the dealers of the association, with all available information at hand, and no real substantial reason for the present chaotic condition has been found, and

Whereas, It is the strong and earnest belief of the members of the association engaged in the legitimate merchandising of motor cars, that a more reasonable policy can be pursued with profit to both dealer and manufacturers; therefore, be it

Resolved, That the Garage Owners' Association of Illinois, in convention assembled, issue a protest against the policy, above described, now in effect among the certain of manufacturers of motor cars with whom members of the association have sales accounts.

And that we, the Garage Owners' Association of Illinois, submit the following suggested plan of procedure as a possible remedy for existing conditions:

First—Selling season to conform more nearly with the calendar year, i. e., 1915 cars in 1915.

Second—Announcement of ensuing year models November 15 to December 1.

Third—Deliveries of demonstrators to dealers to be completed by January 1.

Fourth—National shows to begin at Christmas season, or as at present.

Fifth—Local shows to follow national shows after an interval of four to six weeks.

Sixth—Factories to reach maximum production in May or June; and be it further

Resolved, That a copy of the resolutions be respectfully submitted to the National Automobile Chamber of Commerce, with a plea for earnest consideration.

It would appear that there is room for considerable improvement in present methods and no doubt a satisfactory solution of the difficulty will be forthcoming in the near future.

TO BUILD MEMORIAL TO A. R. PARDINGTON

The recent decision of the directors of the Lincoln Highway Association to build a memorial section to the late A. R. Pardington, whose activities were responsible to such a great extent for the remarkable development of the Lincoln Highway, is meeting with the hearty approval of thousands of friends who mourn his loss. Mr. Pardington was associated with the automobile industry since its earliest days, and thus gained a wide acquaintance from coast to coast. The knowledge of his untiring efforts in forwarding the Lincoln Highway cause is generally known and appreciated. On this account the decision to erect a memorial section that will be a fitting tribute to his memory, somewhere on the route of the highway between Salt Lake City, Utah, and Reno, Nevada, has met with general acclaim.

A fund is to be raised by the Lincoln Highway Association for this purpose, which will be kept entirely separate from other finances of the organization, and it is proposed to make it large enough to erect a section that will be entirely fitting as a proper memorial. It will be built at that point where aid is needed and where local funds are most inadequate to do the necessary work. But the certain co-operation of the locality which is to have the section must be assured before money can be expended for such a purpose upon it.

The association is now accepting pledges of funds to be devoted to this purpose and desires that money or pledges be forwarded to the national headquarters in Detroit, where they will be held until the decision of the exact point for the construction has been reached.

WEIGLEIN SELLS INTEREST IN ENTERPRISE BRASS AND PLATING CO.

The close business relation heretofore existing between the Monarch Carriage Goods Co. and the Enterprise Brass and Plating Co., of Cincinnati, have been dissolved, Mr. Weiglein selling his interest in the latter concern.

The Enterprise Brass and Plating Co. is officered as follows: President and treasurer, C. Apfel; secretary, C. Kloos; general manager, John A. Huth. It is their intention to manufacture carriage and automobile hardware more extensively than they have in the past, and have leased a building at the southeast corner of Sixth and Baymiller streets, which they will occupy after the first of the year.

FORD ASSEMBLY OPERATION POPULAR WITH VISITORS

To the thousands of visitors who each month pass through the Ford factory in Detroit one of the most popular operations or series of operations is the final assembly line down which passes each of the Ford cars which make up the immense Ford factory assembly. The observer sees the car on the long elevated track grow part by part from a rear axle to the finished chassis which leaves the assembly line under its own power.

In the Ford final assembly all the units meet the conveyor at the point where they are needed. At the start of the track a front axle unit, a rear axle unit and a frame unit are assembled together. This assembly is then started in motion by means of a chain conveyor, and as it moves down the room at a constant speed of eight feet per minute each man assembles one part, or does one operation which is assigned to him, so that when the chassis reaches the end of the line, it is ready to run on its own power.

After the gasoline tank is assembled, a number of small units are added, such as the hand brake control lever, gasoline feed pipe, and fender irons, until the point is reached at which the motor is placed in the frame.

Ordinarily the setting of a motor in the frame is a long operation, but in the Ford assembly the motor is elevated by a hoist and lowered into place while the chassis is moving along the conveyor track. From this point other parts are added, and bolts tightened, until the growing chassis reaches the bridge on which the dash unit is deposited by a chute from the second floor, where it has been assembled.

As the final step in the assembly, the rear wheels on the finished chassis drop into a set of revolving grooved wheels, sunk into the concrete floor, and driven by an overhead motor. Two ends are accomplished by this operation: first, when the wheels of the car revolve with the grooved wheels, this motion is transmitted to the differential through the drive shaft to the motor, limbering up all these parts; the second is that while the parts are being limbered up, the switch is turned on and the motor started.

At the end of the line the complete chassis is driven out into the yard under its own power.

C. H. A. T. EXECUTIVE COMMITTEE MEETS

The executive committee of the Carriage, Harness and Accessory Traveling Men's Association met at the Hotel Wallick in New York City the evening of November 15 and laid out the program for the coming year.

President C. J. Rennekamp was unable to attend but he sent a communication and appointed the following committees:

Entertainment committee for 1916 convention—Joseph Niehaus, chairman; Harry Jay, Wm. F. O'Brien, Grant Wright, Geo. W. Huston.

Membership committee—Joseph Niehaus, chairman; W. W. Wood, G. A. Tanner, Grant Wright, P. D. Randal, Geo. W. Huston, O. B. Bannister.

W. W. Wood, of the Carriage and Wagon Builder, was re-elected chairman of the executive committee. It was decided to hold the next convention in Cincinnati, the last week in September, 1916, during the annual convention of the Carriage Builders' National Association.

SPRINGFIELD BODY CO. REINCORPORATES

The Springfield Body Co. has been incorporated for \$1,000,000 in Springfield, Mass., to take over the business of the Springfield Metal Body Co. This reincorporation has been made necessary on account of increased business which has shown a gain of 3,000 per cent. in the last 120 days.

Plans are now under way for a plant in Detroit which will be used for large orders, while the Springfield plant will be used for small orders.

Hinsdale Smith, of Holyoke, and A. P. Smith, of Granby, the owners of the old company, are included in the list of incorporators with W. L. Fry, of New York; E. W. McGookin, of Detroit, and F. W. Fuller, of Springfield.

W. L. Fry has been elected president of the company; Hinsdale Smith, vice-president and chief engineer; E. W. McGookin, vice-president and director of sales, and A. P. Smith, treasurer. Mr. Fry became interested in the company about a year ago and was instrumental in the organization of the new company.

Both Hinsdale and A. P. Smith have been in the automobile business for some years. The Springfield Metal Body Co. was incorporated with a capital of \$20,000 in 1905, occupying the old Boston & Albany shops until it moved to Brightwood, where the company owns and occupies three large buildings.

The new stock is divided into \$250,000 preferred and \$750,000 common. This will probably not be placed before the public, but taken by the trade.

BOSCH AND SPLITDORF COMPANIES SETTLE SUITS

Magneto patent suits instituted about two years ago between the Bosch Magneto Co. and the Splitdorf Electrical Co. have been amicably terminated. In two suits by Bosch against F. A. Baker, who sold Splitdorf-equipped motorcycles, Splitdorf recognizes the validity of the Bosch patents. In one suit by Splitdorf against Bosch, Bosch recognizes the validity of the Splitdorf patent. It is stated that this ending of the litigation will have no great effect, because both companies some time ago discontinued the alleged infringing constructions.

One suit, Bosch vs. Baker (Splitdorf), was upon Bosch patent No. 974,967, covering magneto ignition in V-type gasoline engines.

The other suit, Bosch vs. Baker (Splitdorf), was upon the Gottlieb Honold patent, No. 900,542, covering a construction which gave a prolonged high-tension spark with a high-tension magneto.

The suit, Splitdorf vs. Bosch, was upon patent No. 1,074,416, covering a means for changing the polarity of the armature to coincide with the polarity of an external current during the time that the primary winding on the armature is coupled with the external source of current. All three suits were in the United States district court in New York City.

ENGLISH WAR-TRUCK TROUBLES

A United States engineer gives us the benefit of his experiences gathered during a tour behind the lines in France says Motor (London). He states that many English makes of trucks using force-feed lubrication have trouble owing to breakage of the outside oil pipes. The ignition also needs improvement, as it is not, as a rule, made sufficiently waterproof. Another fault is lack of sufficient road clearance, and on many occasions owing to this cause the tie-rod of the steering gear has struck the ground and thrown the wheels out of line. Others with very large rear axles catch the mud and have not sufficient power to drag themselves out. There is accumulating evidence that a 15 inch clearance is essential.

Difficulties in the matter of lubrication also extend to the road wheels and universal joints. The grease cups which are usually supplied for this purpose, as a rule, either break off or are lost. Thermo-syphon circulation of the cooling water of trucks for war purposes is a complete failure! Clutches also are not sufficiently foolproof, and in future will have to have a much larger factor of safety allowed.

A dimension which ought to be standardized in future on all lorries specifically intended for war purposes is the height of the loading line. This should be made so that lorries can back up to railway trucks and then have the load transferred from railway wagon to the floorboard of the motor vehicle with a minimum of trouble.

NEW WORK ON SOUTH AMERICAN FINANCIAL AFFAIRS

A new publication has just been issued by the Bureau of Foreign and Domestic Commerce, which should be of a high degree of interest to all who are giving attention to the problem of the extension of our trade abroad. It is entitled "Financial Developments in South American Countries," and reviews in about 40 pages of a very clear and forcible style the situation as regards the currency, the money market, the principal banks, and the general condition of business in Argentina, Bolivia, Brazil, Chile, Peru, and Uruguay, during the last two or three years. Especial emphasis is placed on the results of the European war and the measures taken by the various governments, financial institutions, and commercial communities to meet the situation thus created.

The author of this publication is William H. Lough, vice-president of the Alexander Hamilton Institute, who has recently made a trip through the countries treated. Bankers, manufacturers and exporters who wish to obtain definite and up-to-date information with regard to the present state of affairs in South America as to credit extension, government finances, currency conversion, emergency measures and prospective changes and reforms should by all means acquaint themselves with the contents of this book. It is to be had from the Superintendent of Documents, Government Printing Office, Washington, D. C., for the price of five cents.

GENERAL ELECTRIC BUYS INTEREST IN OWEN CO.

The General Electric Co., Schenectady, N. Y., has secured a substantial interest in the R. M. Owen Co., manufacturer of the Owen magnetic car and controller of the patents of J. B. Entz on electric transmission systems as employed in this car. Co-incident with the appearance of the General Electric Co. in this movement is the organization of the Entz Motor Patents Corporation, which will control all of the Entz electric patents and also has a license to use all of the General Electric patents that will be helpful in the Entz electric system. This new corporation is capitalized at \$6,000,000, made up of \$5,000,000 common and \$1,000,000 7 per cent. preferred.

The General Electric Co. has already begun tooling up its Fort Wayne, Ind., factory for the manufacture of the electric unit for the Owen company, and all other concerns that will be licensed by the Entz Motor Patents Corporation, to use the Entz transmission system.

The R. M. Owen Co. will continue the manufacture of the Owen magnetic car at its factory. R. M. Owen will be president of the Entz Motor Patents Corporation, and E. S. Partridge will be sales manager.

RUST

The following is an extract from a paper on "Corrosion of Iron and Steel," by Mr. W. J. E. Binnie, M.I.C.E. F.G.S., read before the Institution of Sanitary Engineers:

For many years corrosion was thought to be a simple oxidation, but in 1838 it was proved that the air did not corrode a polished iron cross which had been placed on the summit of a mountain and exposed for several months. The explanation is that at the low temperature which obtained at this elevation there was an almost complete absence of water vapor.

That dry air will not act at temperatures below 100 deg. C. has since been confirmed by many other experiments. In the same way pure water, free of all dissolved air, is practically inert on iron.

It has been shown that oxygen and water vapor do not corrode iron unless the temperature falls to below the dew point, but when condensation occurs corrosion becomes active. Water and oxygen being necessary for corrosion, the question presents

itself as to whether corrosion is due to these elements alone. According to one theory the presence of an acid is also required, and this is found in the minute traces of carbon dioxide which are present in the atmosphere and in water.

RHODE ISLAND'S REGISTRATION

An analysis of the registrations of automobiles and motor trucks in the state of Rhode Island up to October 1 shows a total of 14,017 vehicles in use. These are the products of 243 manufacturers, a large number of whom, of course, are no longer active in the car and truck-building field.

Owing to the fact that a number of vehicles are registered under their trade name where the manufacturer makes both passenger cars and trucks it is impossible to tell exactly the number of each. However, counting each of these manufacturers as passenger car producers only, there are 215 of these represented as compared with 22 truck builders and six makers of electric cars. On the same basis there are 13,888 passenger cars, 71 motor trucks and 58 electric machines.

Going by the number of cars of each make registered, Ford leads with 4,413, Cadillac being second with 1,070, Overland third with 817, and Buick fourth with 719. Then come Packard with 394, Studebaker 388, Maxwell 365, Reo 319, Chalmers 307, Hupmobile 303, Hudson 254, and Pierce-Arrow 249. There are twelve other manufacturers who have over 100 cars each registered, the other 219 varying from Peerless, with 99, down to a large array with but one vehicle.

R. F. JOHNSTON "FOBBED"

R. F. Johnston, of the R. F. Johnston Paint Co., well known to the carriage trade in Cincinnati and elsewhere, was the recipient of pleasing honors on the occasion of his recent retirement after three terms as president of the Cincinnati Paint, Oil and Varnish Club. He refused to serve for a further term, and in acceding to his wishes to become a plain member again, the club presented him with a handsome jeweled emblem watch-fob, bearing the colors of the club and an appropriate inscription. During Mr. Johnston's administration the membership of the club has almost doubled, and it has become known as one of the liveliest paint organizations in the country, only three paint clubs exceeding it in size, and none in percentage of membership in the trade.

THE HARDWOOD MANUFACTURERS' CONVENTION

The board of governors of the Hardwood Manufacturers' Association of the United States at its quarterly meeting, November 20, decided to hold its next annual convention of the association in Cincinnati on January 18 and 19, 1916. The sessions will be held at the Hotel Sinton.

The program, while not yet completed, promises to be one of interest and value to all lumbermen and to business men in general. The association is not yet ready to announce the names of the speakers who have been secured to address this meeting, but it is understood that several of the more prominent men in the industry will be on the program.

REQUIRED MOTOR-VEHICLE EQUIPMENT IN CURACAO

The requirements in Curacao, W. I., are that all motor vehicles to be used on roads must be provided with: An accurately working steering gear; a reverse speed; at least two strong brakes, working independently of each other, under the control of the operator, by which the vehicle may be brought to a standstill at any moment; and at least one horn or siren, the sound of which is distinctly audible at a distance of 100 meters (110 yards).

UNEQUAL TIRES CAUSE TROUBLE

One of the results of the recent increase in so-called "over-size" tires in the United States has been the growth of rear axle troubles, due to the fact that many motorists will put a "regular" 34 x 4 tire on one rear wheel, and an oversized tire of a different make on the other rear wheel. Theoretically both tires are 34 x 4, but in practice the oversize tire is nearer 34½ x 4¼. Careful measurement of tires of different makes will sometimes show a variation of ½ an inch, and even more in the outside diameter. Plain tread and non-skid of the same make will occasionally show similar variations. One motorist who used tires of different makes, which on examination proved to differ by nearly ¾ of an inch, calls attention to the troubles he had before he located the cause: His rear axle leaked oil, as did the brake drum on the wheel with the smaller tire; steering was interfered with, and the tires wore off unevenly and rapidly. In one case two tires 34 x 4 were measured, with the following result: One was 34½ x 4 3/16, the other 33¾ x 3¾; the difference in distance between clinchers was ¾ inch in favor of the first tire. From these experiments it would seem that tires of the same type and make should be used on the wheels of the same axle.

WILLYS-OVERLAND, LTD., FORMED IN CANADA —\$6,000,000 CAPITAL

The Willys-Overland, Ltd., has been formed in Canada with a capital of \$6,000,000 and head offices in Toronto. J. N. Willys, head of the Willys-Overland Co., Toledo, O., will be president of the new company. T. A. Russell, at present vice-president of the Russell Motor Car Co., of Canada, will be vice-president.

Five of the directors of the Willys-Overland Co., of Toledo, will be directors of the new company; these are J. N. Willys, H. T. Dunn, Walter Stewart, Harry Shepler, C. A. Earl, T. A. Russell and Lloyd Harris, of Toronto, and two of the other Canadian stockholders will also be on the board.

This new company will take over the complete automobile business of the Russell Motor Car Co., and all of the business in Canada of the Willys-Overland Co.

Although the Canadian company will be independent of the parent company and will be conducted entirely independent as a Canadian corporation, it will have the advantage of the advice and engineering skill of the Willys-Overland Co. organization. The plan is to undertake in Canada the actual manufacture of both Overland and Willys-Knight automobiles. For this purpose the plant of the Russell Motor Car Co. of Toronto has already been acquired and this quickly will be enlarged to permit quantity production.

FRENCH ARMY SELLS TRUCKS

That French manufacturers of motor trucks can now meet all the demands of the army for vehicles is shown by the fact that an auction sale was held recently in Paris, at which 740 internal gear drive omnibus chassis formerly used in Paris and commandeered when the war broke out, were sold to private users.

These have been replaced in the French army service by new chassis of the same type. By this method the French keep the army equipment up to the highest point of efficiency, while at the same time they supply private owners who badly need trucks, so that there is no opening left for the purchase of foreign trucks. If some foreign chassis were used buyers might continue to purchase them after the war because of their good qualities or in the interest of standardization.

The foreign trucks used by the French army are not sold even as second-hand trucks, but will be used until they are worn out and then junked. In this way the French market will be kept entirely for the French makers.

FIFTH AVENUE BUSES' BIG EARNINGS

The Fifth Avenue Coach Co., New York City, during its fiscal year, ending June 30 last, carried 14,050,471 passengers at 10 cents each, in its 133 busses, its revenue from this source amounting to \$1,405,047.10, or 34.52 cents per active bus mile. The total mileage of the busses, including 43,929 miles, was 4,113,625. Its revenue from the livery service, amounting to 19,374 bus miles, was \$15,086, and the advertising in its busses amounted \$31,375, thus bringing the total revenue from operation up to \$1,451,508.10, just \$274,857.72 more than the previous year.

A feature brought out in the report of the company is that the 133 busses ran at a cost of only 1.504 cents per bus mile, each bus using six tires, the rear wheels each having two tires. Last year the cost was 1.7 cents; the previous year, 2 cents; and the year before that, 3.13 cents. This greater tire mileage is attributed to a better grade of rubber; better supervision; better drivers; better brake mechanism; and the use of steel wheels instead of wood. The company paid out in tire maintenance during the year, \$61,941.10.

STRENGTH OF CAST STEEL

As an illustration, says Iron Age, we will assume that the ultimate strength of cast steel is 65,000 lbs. per sq. in. and the elastic limit is quoted at 35,000 lbs. per sq. in. Many malleable plants today are producing iron with an average ultimate strength of 50,000 lbs. per sq. in., which, while lower than the ultimate strength of steel at 65,000 lbs., still has an elastic limit of approximately 38,000 lbs. per sq. in., or about 8 per cent. higher than that of steel. Since in the design of castings it is the elastic limit and not the ultimate strength which is considered, it would seem that the facts, in connection with the superior soundness and freedom from blowholes of malleable castings, should be ample justification for using a lower factor of safety in arriving at the working stress to be used.

Malleable iron has greater rust-resisting properties than any of the other ferrous metals. Therefore, for use in railroad, implement and other work subjected to corrosion, it is to be preferred to cast steel or gray iron.

JAPAN RUSHES TIRE MANUFACTURE

Japanese rubber factories are working at top speed at present endeavoring to capture the far eastern market, before the British and German manufacturers can again become competitors. Heretofore, American manufacturers have been too busy in the home market to bother about establishing a market for their tires in Asia and Australia, and unless steps are taken along these lines in the immediate future, they will find the market preempted by the Japanese. Japan imported about 2,500,000 pounds of rubber in 1913 and 1914, while in the previous years only about 2,000,000 pounds were used annually. The capital invested in the industry is \$2,500,000, and the workingmen number about 4,000.

LIMOUSINE TOP COMPANY BUYS KALAMAZOO BUGGY BLANKET MILLS

The Limousine Top Co., of Kalamazoo, Mich., has purchased the blanket mill building of the old Michigan Buggy Co. from the Manufacturers' Realty Co., which took over the Michigan Buggy Co.'s property.

The blanket mill which is now used as the Limousine Top Co.'s main factory building is 50 x 200 feet, two stories high, and the warehouse 40 x 80 feet, one story high, giving the company approximately 25,000 feet of floor space.

The Limousine Top Co. confines its manufacture to removable limousine tops for automobiles, most of which are made under contract with automobile manufacturers.

Trade News From Near and Far

BUSINESS CHANGES

S. M. Mick, Wingate, Ind., has discontinued his hardware, implement and vehicle business.

Smith & Hudiburg, of Independence, Kas., are retiring from the implement and buggy business.

Chas. Gallutia has succeeded to the vehicle and implement business of Slagle & Co., Pioneer, O.

Tittle & Stotler, vehicle dealers at Millersburg, O., have been succeeded by the Miller Implement Co.

Wm. C. Boren has purchased the hardware, implement and vehicle business of Paul E. Robb, at Poseyville, Ind.

Mrs. L. E. Geil sold her interest in the harness, implement and vehicle business at Glenwood, Ia., to Herbert E. Evans.

James Russell and G. W. Woods have sold their implement and vehicle business at Morocco, Ind., to Eichman & Ainsworth.

The implement and vehicle business formerly conducted by Owen O'Brien at Sharonville, O., has been taken over by G. W. Price.

The implement and vehicle concern of William H. Parson & Co., at Rockwell City, Ia., has sold out to M. Hinton & Son, a new firm.

I. Christensen has purchased the wagon and repair business of J. Maroney, Storm Lake, Ia., and has moved the plant into a new building.

The Maxwell Implement Co., Valparaiso, Ind., has purchased the vehicle, implement, hardware and harness business of W. J. Henry, of that place.

H. B. Hibbett, in the vehicle, implement, hardware and grocery business at Camden, Tenn., has purchased the stock of W. H. Evans & Son.

J. S. Dunham has purchased the George Cochran wagon shop at Lansing, Mich., and will install machinery to manufacture his newly invented city delivery wagons.

The carriage making and blacksmithing business of John Archdeacon, at Carlisle, Ky., has been purchased by Curtis & Lawrence. Rubber tire work will be specialized upon.

S. J. Salmon, formerly in charge of the sales office of the M. Rumely Co., LaPorte, Ind., has purchased interest in the W. I. Henry store at Valparaiso, Ind. The new owners will operate the store under the name of the Maxwell Co., handling hardware, farm implements, automobiles, vehicles, etc.

NEW FIRMS AND INCORPORATIONS

C. F. Brown will engage in the vehicle and implement business at Galata, Mont.

Harry L. Hayes has added a stock of buggies and wagons to his store at Peru, Ind.

A. T. Stephens has engaged in the vehicle and implement business at Cyril, Okla.

The Standard Wagon & Auto Co., Cleveland, O.; A. B. Bookman and others; \$10,000.

R. J. Perry has engaged in the vehicle and implement business at Grand Rapids, O.

John Mast has engaged in the hardware, implement and vehicle business at Greentown, Ind.

James Broadstreet will soon open a hardware, implement and vehicle business at Cloverdale, Ind.

Frank Jones and Elmer Williams will engage in the implement and vehicle business at Richmond, Ind.

The Moore Buggy & Harness Co., Lebanon, Tenn., have engaged in the buggy, harness and implement business at that place.

The Mier Carriage & Buggy Co., manufacturers, has been incorporated at Ligonier, Ind., with a capital of \$25,000. The incorporators are Isaac M. Blum, Hattie D. Mier, Albert Daniel.

The Peter Anderson Co., to build and repair vehicles, has been incorporated at Lafayette, Ind., with a capital of \$15,000. Incorporators are Peter Anderson, Anton Anderson, Clinton Anderson.

J. D. Browdues, who has been engaged in the vehicle business at Martinsville, Ind., for several years, opened a new factory at Vincennes, Ind. November 10, for the manufacture of automobile tops and commercial bodies of all kinds for automobiles.

NEWS OF THE TRADE

The Defiance (O.) Machine Co. is working days and nights to fill orders.

The Auto Wheel Co., Lansing, Mich., has increased its capital stock from \$150,000 to \$300,000.

The Janesville Carriage Works, Janesville, Wis., is about to erect a one-story factory addition. 36 x 66 ft.

The Pioneer Pole & Shaft Co. will equip a wood-working plant near Houlka, Mass., to work up hickory.

The Clarksville Buggy Co., Clarksville, Tenn., is planning to enlarge its facilities and will erect another building.

The Chevrolet Motor Co., Flint, Mich., plans to build an automobile assembling plant at Dallas to cost about \$25,000.

W. C. and J. Moores Fayetteville, Tenn., will establish a vehicle factory, for which equipment is being purchased.

The G. S. Jephson Co., Newark, N. J., will establish a plant on Central avenue, for the manufacture of automobile bodies.

The plant of the Eberly & Orris Mfg. Co., Mechanicsburg, Pa., is to be put on full time to take care of increased orders.

It is reported that the mills of the American Tube & Stamping Co., Bridgeport, Conn., are operating day and night to capacity.

The Pioneer Pole & Shaft Co., Cairo, Ill., is building an engine and boiler house and will install additional wood-working machinery.

The Hess Spring & Axle Co., Cincinnati, has let contract for the structural work on its addition to the Riverside Mills, Martins Ferry, O.

The Fisher Closed Body Co., Detroit manufacturer of automobile bodies, is erecting a two-story mill building. 80 x 388 ft., to cost \$50,000.

The Fort Smith Wagon Co., Fort Smith, Ark., will increase its factory capacity and is reported in the market for the additional equipment.

Elrod & Co., Columbia, Ky., will establish a plant at Erwin, Tenn., to make automobile spokes and other stock. A building has been secured.

The Mutual Wheel Co., Moline, Ill., will erect an addition to its plant, to cost \$10,000, to be used for the manufacture of automobile wheels.

The Fleetwood Metal Body Co., Fleetwood, Pa., has increased its common stock from \$20,000 to \$80,000 and its preferred stock from \$5,000 to \$35,000.

A contract has been awarded for the construction of a 76 x 124 ft., one-story, brick addition to the plant of the Baltimore (Md.) Buggy Top Co.

The Brown Carriage and Auto Co., Cleveland, O., has awarded the contract for the construction of a plant, the estimated cost of which is \$10,000.

The Apple Auto Top Co., Dayton, O., has had plans prepared for a brick building, 100 x 150 ft., four stories, to take the place of its factory recently destroyed by fire.

The Wheeling Motor Car Co., Wheeling, W. Va., expects to build a factory for building motor cars. Inquiries should be addressed to G. M. Ford, care of the company.

The Jenkins Vulcan Spring Co., St. Louis, Mo., capitalized at \$40,000, has been organized by T. B. Jenkins, J. J. Jenkins and others, to manufacture motor vehicle springs and other specialties.

The Detroit Pressed Steel Co., Detroit, manufacturer of steel stampings and automobile parts, has increased its capital stock from \$250,000 to \$650,000. The company has enlarged its plant during the year.

The rumor that the American Tube & Stamping Co., Bridgeport, Conn. has been sold to the Schwab interests has brought forth a denial by Charles G. Sanford, vice-president and treasurer of the company.

The Karges Wagon Co., Evansville, Ind., has turned down an order for wagons from the British government because the plant is running overtime on domestic business. The working force has recently been doubled.

The Kressler Automobile Co., Fostoria, O., has been organized with a capital stock of \$200,000 and has leased the plant of the Fostoria Stave & Barrel Co. P. J. Blaser, G. F. Kressler and Henry Oskchin are interested.

The Perfection Spring Co., Cleveland, maker of automobile springs, has increased its capital stock from \$1,500,000 to \$2,500,000. The only change in the organization is the addition of three names to the board of directors.

The Hupp Motor Car Co., Detroit, has increased its capital stock from \$1,000,000 to \$2,500,000. This will allow additional working capital and will enable the company to make plant extensions and additions to equipment.

The Sun Motor Car Co., Buffalo, is preparing to move its plant to Elkhart, Ind., and has purchased the plant of the Sterling Motor Car Co. of that city. The plant will be enlarged to manufacture a six-cylinder automobile.

The Michigan Hearse & Motor Co., Grand Rapids, Mich., manufacturer of automobile hearses, is doubling its capacity by the erection of an addition to cost about \$20,000. Equipment costing several thousand dollars will be purchased.

The Hupp Motor Car Co., Detroit, has completed negotiations for the purchase of the American Gear Mfg. Co., Jackson, Mich. It is stated the plant will not be removed to Detroit, but that the present factory will be enlarged and improved.

The Buick Motor Co., Flint, Mich., is having plans made for a gray iron foundry, 240 x 270 ft., two stories, to be built of reinforced concrete and steel, which will have a capacity of 200 tons or more of metal per 10 hours. It is in the market for foundry equipment, particularly monorails, hoists and cranes.

The Kissel Motor Car Co., Hartford, Wis., has broken ground for an assembling building, of brick and mill construction, 71 x 315 feet, three stories, to be ready April 1. About 250 men will be added to the payroll. The erection of an office building has been deferred until spring, as all available men are employed on the assembling shop. Work on a new enameling building and warehouse addition has been completed.

NEWS OF THE TIRE TRADE

The Miller Rubber Co., Akron, O., will erect an additional factory.

The Savage Tire Co., San Diego, Cal., will build an addition to its plant on Main street.

The Firestone Tire & Rubber Co., Akron, O., will shortly begin the erection of two buildings.

The Cleveland Ford Tire Co., Ashtabula, O., has placed a contract for the erection of a plant, 73 x 150 ft.

The Howe Rubber Co., New Brunswick, N. J., maker of automobile tubes, will expend \$70,000 for the construction of a new factory building in that city.

The B. F. Goodrich Co., Akron, O., has commenced the erection of a new machine shop. Orders have been placed for some additional machinery and probably more will be required.

The Toledo-Ford Tire Co., Findlay, O., has changed its name to the Toledo-Findlay Tire Co. upon the advice of a legal representative of Henry Ford, who claimed the company was infringing upon his rights.

A tire plant is planned for Wichita, Kas., by the Wichita Auto Tire Mfg. Co., with a capital of \$600,000. The incorporators are Charles Darrigrand, Ransom Stephens, C. H. Matson, W. T. Watson and M. V. Price.

A. C. Friedman and Frank Sale, president and vice-president of the Western Double Tread Tire Co., 1241 Broadway, Denver, and Leo Jacobson, are organizing a Utah corporation to operate a double-tread tire plant in Salt Lake City.

W. V. Logan, recently manager of the manufacturers' department of the Goodyear Tire & Rubber Co., is now associated with the McGraw Tire & Rubber Co., East Palestine, O., in the capacity of assistant general sales manager.

The Racine Rubber Co., Racine, Wis., manufacturer of tires and rubber goods, has broken ground for a three-story addition at Racine Junction, to cost about \$75,000. It will be 52 x 77 ft., to be used for mill room and crude rubber storage and will be ready February 1.

The New Castle Rubber Co., New Castle, Pa., will increase its capital stock from \$500,000 to \$1,000,000. It started to manufacture automobile tires a few months ago and is having such a heavy demand for its product that it has decided to practically double the capacity.

The United States Rubber Co. will shortly reopen the plant of the Lycoming Rubber Co., Williamsport, Pa. Minor repairs are being made to the plant which will be ready for operation before January 1. It is understood that the company intends to use the plant as an "overflow" factory.

The McNaul Tire Co. has been incorporated with a capital of \$2,500,000, to succeed the McNaul Auto Tire Co., Toledo, O. The plant will be enlarged by the reorganized company and employment given to 1,000 more men. W. D. McNaul is president; M. W. McNaul, vice-president, and A. B. Laskey, secretary.

The Giant Tire & Rubber Co., Akron, O., has been formed with a capital stock of \$50,000 to take over the M. & M. Rubber Mfg. Co. Claude E. Hart and J. E. Schaefer, secretary and treasurer of the old company, will hold the same offices in the new organization. It will move its plant to its two-story building on North Howard street.

According to the estimates made by one of the leading rubber companies, the production of crude rubber in 1915 will reach 142,000 tons. Almost one-half of this amount will be used in the United States, and half of this will be turned into rubber products at Akron, O. Plantation rubber was grown in 1915 on 1,330,000 acres, producing two-thirds of the world's rubber.

At a special meeting of the stockholders of the Kelly-Springfield Tire Co., in Jersey City, the proposed reduction in the par value of the common shares from \$100 to \$25 was authorized. Common stockholders were also given the voting privilege of one vote for each share of a par value of \$25, while the preferred stockholders, to equalize the voting power of both classes of stock, were given the right of four votes for each share of preferred stock held by them.

AMONG THE TRUCK MANUFACTURERS

The Columbia Casting Co., Detroit, Mich., has increased its capital from \$30,000 to \$100,000.

The trustee of the Brown Commercial Car Co., Peru, Ind. has asked for authority to sell the plant.

The capital of the Christie Kline Forge Co., Detroit, Mich., has been increased from \$3,000 to \$10,000.

J. D. Cotton has been appointed advertising manager of the Four Wheel Drive Motor Co., of Clintonville, Wis.

The Columbia Commercial Car Co. is moving its plant from Kalamazoo to Pontiac, Mich. The company has an order for 50 trucks for early delivery.

The capital stock of the O. K. Motor Truck Co. has been increased from \$10,000 to \$25,000, and has changed its name to the Lincoln Motor Truck Co.

Plans to increase the facilities for the manufacture of commercial vehicle bodies are being made by the Peters Wagon & Auto Works, East and Ensor streets, Baltimore.

The Krebs Commercial Car Co., Clyde, O., has been reorganized as the Clyde Car Co., capitalized at \$25,000. J. W. Flickinger, Albert A. Wott and J. R. Baynes are interested.

R. J. Tower has organized the Tower Truck Co., at Greenville, Mich. The first machine was recently completed. It has a Continental motor, Timken axles and a 135-inch wheelbase.

A new factory for the Wichita Motor Truck Co., Wichita Falls, Tex., is being built in Dallas. No statement has been made whether the company is to remove its entire business to Dallas.

The stockholders of the Republic Motor Truck Co. have voted to increase the capital stock of the company for the second time this year. This time the raise is from \$250,000 to \$500,000.

The Brockway Motor Truck Co., Cortland, N. Y., has purchased an acre of land near its present plant and is erecting a building 40 x 186 ft. A second building will be built the coming spring.

Henry Jossman formerly with the Oakland Motor Car Co., has been appointed sales manager for the Columbia Truck and Trailer Co., which recently moved to Pontiac, Mich., from Kalamazoo.

The plant of the Hurlbut Motor Truck Co., New York City, has moved to Third avenue and the Harlem River, where more space is available and both water and rail shipments from the plant are possible.

The Duplex-Power Car Co., of Charlotte, Mich., has re-elected its officers. They are Frank P. Town, president; Frank E. King, vice-president; Horton H. Bryan, treasurer, and M. J. Lamson, secretary.

A strike has tied up the auto and truck body plant of Theodore Kundtz in Cleveland, O., which has been making bodies for Cleveland truck and car firms that have been turning out trucks for the allies.

Seven additional motor vehicles, 17 in all, have been added to the mail fleet of the Columbus, O., postoffice. Only two-horse wagons, which are used in delivering parcel post packages in the congested districts, are now in service.

The Larrabee Deyo Motor Truck Co., Inc., has been formed at Binghamton, N. Y., to build motor trucks and manufacture accessories with capital of \$80,000. The incorporators are H. C. Larrabee, A. C. Crossley and A. J. Parsons.

The Detroit Commercial Car Co. is to occupy a part of the plant of the Pontiac Chassis Co., Pontiac, Mich., which is making the chassis for its machines. The company expects to sell 5,000 vehicles the first year. A selling organization is being formed.

The Battle Creek (Mich.) Motor Truck Co. is planning a new plant to manufacture a new four wheel drive truck of $\frac{3}{4}$ -ton

capacity. The men chiefly active in the company are Maurice Bollstrom, designer of the truck; F. E. S. Tucker, an advertising agent, and J. E. Fellows.

The Sterling Motor Truck Co., formerly the Sternberg Motor Truck Co., West Allis, Milwaukee, has increased its capital stock from \$250,000 to \$350,000. It has under way a shop addition and is making other extensions. Victor L. Brown is president and Robert G. Hayssen, secretary.

The Thomas B. Jeffrey Co., Kenosha, Wis., will build two more factory buildings to accommodate its foreign truck orders, both three stories. The Jeffrey company is employing approximately 2,500 workmen, compared with 1,300 a year ago. Its previous maximum working force was 2,100.

The Iowa Motor Truck Co. is to manufacture trucks at Ottumwa, Ia., which at first will be marketed exclusively in the middle west. The vehicles will be of 2,000 and 3,000 pounds capacity. Internal gear drive rear axles are to be used. Supplies for six months' manufacturing have been ordered.

A one-story addition, 70 x 176 feet, is being erected by the Michigan Truck & Lumber Co., Holly, Mich. In addition to doing contract work for the Ford Motor Co. the concern has closed contracts with the Buick, Hudson and Maxwell companies, of Detroit, and the Chandler company, of Cleveland.

The Bell Motor Car Co., of York, Pa., is shipping a light delivery wagon of 1,200 pounds capacity, equipped with open and closed bodies. It is mounted on the same chassis as the Bell passenger car and has an electric lighting and starting system. A Bosch magneto is used instead of distributor ignition. The price is \$750.

J. S. Hurd, of Philadelphia, formerly associated with the Gramm-Bernstein Co., of Lima, O., is now traveling representative of the Four Wheel Drive Auto Co., of Clintonville, Wis. F. A. Cole, of New York City, who was connected with the Four Wheel Drive Co., has again joined that company as a traveling representative.

The Autocar Co., Ardmore, Pa., has increased its capital from \$1,000,000 to \$2,000,000, and its output of trucks will be doubled. The sales of the company have increased 70 per cent. during the past ten months, due entirely to growing domestic demand. The new stock is being taken by the original founders. More than 3,000 Autocar trucks are in use.

The National Brake & Electric Co., Milwaukee, Wis., is developing a new heavy duty motor truck of the gas-electric type said to be especially adapted for war service. The company is one of the Westinghouse group. The National company manufactures compressors, gasoline locomotives, air brakes and electrical appliances. The men employed in the plant have been increased in number from 700 to 1,000 since July 1.

The Martin Carriage Works, York, Pa., is producing a considerable number of motor trucks and special fire department apparatuses. The fire apparatus has been sold largely to volunteer companies in Pennsylvania and New Jersey. The chassis are equipped with Wisconsin engines and are assembled. The company is also starting work on 1,000 light commercial wagons having load capacity of 1,000 pounds. Thirty different designs of bodies for various purposes have been made for equipping the wagons.

Quick work was done in designing and preparing for the market the Acme truck which is to be produced by the Cadillac Auto Truck Co., of Cadillac, Mich. The design of the two-ton and $\frac{3}{4}$ -ton trucks have been completed. The two-ton truck will sell for \$2,000. Many standard parts are used in the truck including a Continental engine, Rayfield carburetor, Long truck type radiator, Pierce governor, Warner clutch and gear set, Smith pressed steel heat treated frame, Detroit springs, Gemmer steering gear, Timken front axle and Timken-David Brown full floating rear axle.

The Electric Vehicle Association of New York has officially recorded a new electric delivery wagon record made by a Ward special delivery wagon, which covered 98 miles on a single

battery charge in 16 hours and seven minutes, of which 12 hours and 2½ minutes was actual running time. The speed averaged 8.1 miles an hour and the number of stops was 35. The current consumed was the equivalent of 164.5 ampere-hours. This figures out at 1.68 ampere-hours per mile. The conditions were not favorable, as the run was made in a drizzling rain, which made the pavements slippery.

The Jewett Car Co., of Newark, O., has begun the manufacture of one-ton trucks of which the Ford passenger car chassis is the basis. The truck is made up of the front part of the Ford chassis, with the engine mounted in a sub-frame and an internal gear drive rear axle. The rear construction is heavy and arranged to carry 90 per cent. of the truck load. This machine, it is said, will carry its load 18 miles on a gallon of gasoline. The chassis is sold for \$800 and bodies of various types can be supplied at an average cost of about \$50. A. P. Hess, of the Hess Auto Co., Newark, O., has undertaken the marketing of the truck.

The Baldwin Locomotive Works, Philadelphia, Pa., intends to engage in the automobile and motor truck industry, from which the American Locomotive Co. was withdrawn, according to reports at Eddystone, where 300 trucks for the Russian government are now being built. The company is building a 20-acre plant for the Remington Arms Co., which will be used for arms manufacture during the war, after which it is understood it will be permanently devoted to the automobile department of the company. The trucks being built for Russia are equipped with low steel wheels that have heavily ribbed arms to prevent skidding. These will be used to haul small trailers from railroads to the front, laden with supplies and munitions.

P. D. Wagoner, president of the General Vehicle Co., Inc., Long Island City, N. Y., which, with the Peerless Motor Car Co., Cleveland, O., recently became a subsidiary of the Peerless Truck & Motor Corp., states that the new interests will not in any way change the company's operating management or affect its relations with customers. There will also be no change in the company's manufacture of electrical apparatus and it will continue to devote its energies to the development of the electric vehicle business. The manufacture and marketing of the Mercedes truck will also be continued. The 5-6-ton size is now in production and arrangements are being made for the other sizes to go into production shortly. The company is also planning to actively engage in the manufacture and sale of the Mercedes aeroplane motor.

The Chase Motor Truck Co., Syracuse, N. Y., which recently announced that its business during the past year had increased 218 per cent. exclusively on domestic business, announces a new model of one-ton worm drive truck. Up to the time the line has consisted of a 1,500-pound truck, a 4,000-pound truck and a 7,000-pound truck. The new one-ton truck will sell for \$1,650. It has 140-inch wheelbase, 36 x 3½ in. front wheels and 36 x 5 in. rear wheels. The front axle is an I beam section. The rear axle is a Sheldon worm. The carbureter is a Holley. The engine is cooled by water. A Bosch high-tension magneto is used. The transmission gearset is Brown-Lipe selective sliding gear. Other constructional details include a dry plate clutch, semi-elliptic springs and a heavy hydraulic pressed steel frame. The weight of the truck on the rear axle is 53 per cent., while 83 per cent. of the pay load is carried on that axle. Electric lighting and starting equipment is furnished at extra cost.

PREDICTS SHORTAGE OF AUTOMOBILES

"Never before in the history of the industry has the material market been so unruly," says William C. Poertner, president of the Poertner Motor Car Co.

"The raw material market is making many manufacturers and parts makers lie awake nights, and it means that there will be a shortage of cars in the spring. Makers are finding it difficult to increase the production in the ratio that sales are in-

creasing, and while it was thought the day of 'premium for deliveries' had passed, it is practically certain that cars will sell at a premium when the rush of the spring selling season begins.

"The National factory has been fortunate in getting a large amount of raw material needed and will not be held back in production. I was pleased to find, too, that the Jeffery company had prepared for the emergency."

PRACTICAL DEPRECIATION SCHEDULE

The Larkin Company, of Buffalo, which operates 13 trucks, has adopted a novel plan for charging depreciation. Instead of 20 per cent. a year the company charges off the first year 33⅓ per cent. of the cost of the truck, and the next year 33⅓ per cent. of the remaining two-thirds, and so on indefinitely.

Thus, if a truck cost \$3,000, the first year's depreciation would amount to \$1,000, the second year's depreciation to \$666, the third year to \$444 and the fourth year to \$296.

The scale has been adopted because it takes care satisfactorily of the heavy initial depreciation which results when a new vehicle is put into service and because it tends to equalize increasing repair and maintenance charges which grow greater with the use of the machine. It is undoubtedly more accurate in the last years of truck use than charging off the entire value of the machine in five years.

TO WIND UP TRUMBULL MOTOR CO.

At a meeting of the stockholders of the Trumbull Motor Car Co., Bridgeport, Conn., held November 23, it was voted to petition the Superior Court to appoint a receiver to wind up the affairs of the company. It was incorporated for \$300,000 and was supposed to be doing a satisfactory business, but the loss of an expected large foreign business due to the war and the death of the company's president, Isaac B. Trumbull, who was lost on the Lusitania, probably had much to do with the decision of the stockholders. All the officials of the company are connected with the Connecticut Electric Co., the two companies jointly occupying the same plant, and it is supposed that the purpose is to eliminate one of the organizations. Judge Edward K. Nicholson was appointed receiver by the Superior Court.

STAVER COMPANY SELLS BUGGY BUSINESS

The Brown Carriage Co., of Cincinnati, O., has purchased the stock of carriage materials and the good will of the Staver Carriage Co., of Chicago. The Brown company will continue the manufacture of the Staver line of buggies, carriages, etc., and the Staver plant will be utilized for this purpose at least until the stock of material purchased has been exhausted.

When asked concerning the future of the Staver company, Secretary McAdow stated that announcement at this time would be premature, as the company's plans have not been determined. It is expected that the plant will be utilized by the company for manufacturing purposes, but the character of the product has not been decided.

COMMERCIAL VEHICLE LICENSES IN MICHIGAN

Commercial vehicle licenses to the number of 2,610 were issued by the secretary of state of Michigan from January 1 to June 30. Of these 111 were electrics. There were 102 makes on the list. The I H C was represented by 324, the G M C by 259, the Federal by 228, the Republic by 127, the Universal by 144, the Packard by 120, the Commerce by 117, the Reo by 82, the Durant Dort by 91, the Horner by 61, the Detroit, the G. V. and the Baker, all electric machines, were represented by 55, 16 and 22 respectively.

CHANGE STYLE OF UPHOLSTERY

It is interesting to note the change in the style of upholstery of motor cars which has been made during the last year. Formerly all upholstery was tufted in squares or diamonds, and it was believed by this method only could the padding and springs be securely held.

The old style of upholstery has given way to a great extent to what is known as the "straight pipe" type by which the leather is sewed up and down at regular intervals, but not across. One of the cars to adopt this style was the Marmion which has been using it on all cars turned out for several months. The advantage of this type of upholstery, it is claimed, is that it provides a neater finish, softer upholstery and more secure binding of the hair.

NOVEL AUTOMATIC GEAR CHANGE

One of the latest British inventions consists of a new type of automatic gear change for automobiles. Generally speaking, the speed gear comprises a straight-through gear box, operated by a central spindle. The spindle is connected to a spring-controlled sliding member which in its turn is adjusted longitudinally by the centrifugal governor above it. When starting the car the gear lever is shifted from neutral into either the first forward, or reverse positions. After the driven shaft has reached a certain speed, the centrifugal governor automatically brings the next gear into action; when the speed has again increased, the highest speed ratio is engaged similarly. Retarding the speed of the car causes the reverse series of operations to take place.

HORSESHOES EXPORTED DURING JULY

During July, 1914, there was exported to foreign countries by American manufacturers, horseshoes to the amount of \$5,931. During the same month of the present year the exports in horseshoes amounts to \$461,543. Which of the manufacturers are getting the business is not reported in the statement by the Department of Commerce at Washington, but the volume of increase is apparent.

In this connection it might be said that horseshoes showed a greater ratio of increase for the year than any other commodity exported by the American manufacturers.

BABCOCK TO BUILD COMMERCIAL BODIES FOR FORDS IN QUANTITY

The H. H. Babcock Co., Watertown, N. Y., is building commercial bodies for Fords in thousand lots on the unit plan. There are eight different types, to fit every requirement in light delivery service, built up from one standard body-base by adding units. The bodies are delivered painted complete with all fittings and ready to assemble.

TO MAKE AUTOMOBILE WHEELS

The Mutual Wheel Co., Moline, Ill., which has previously limited its output to wheels for wagons, buggies and farm machinery, has embarked in the manufacture of wooden wheels for automobiles. A special building has been erected to carry machinery for the new department.

FORD REDUCES CLOSED CAR PRICES

The Ford Motor Co. has reduced prices on its sedan and coupelet. The sedan which formerly was \$975, is now \$740, a reduction of \$235. The body sells separately for \$400. The coupelet is reduced from \$750 to \$590, a reduction of \$160. This body sells for \$250.

WILL BUILD TRUCKS AND CARS

Motor vehicles for both pleasure and business are now marketed by the Rock Hill Buggy Co., Rock Hill, S. C., which has been making horse-drawn vehicles for 30 years. This department of the business is to be known as the Anderson Motor Co. and J. A. Anglada, of New York, has been retained as engineer. The first season's output is planned as 500 machines. The officers are: J. G. Anderson, president; C. J. Henry, secretary and treasurer, and J. W. Anderson, manager. The pleasure car is to be known as the Anderson.

CELEBRATED EIGHTY-SIXTH ANNIVERSARY

A. A. Cooper, founder and president of the A. A. Cooper Wagon & Buggy Co., celebrated his 86th birthday, November 9. Mr. Cooper has been engaged in business in Dubuque since the early "forties." He is hale and hearty at his advanced age and maintains strict supervision of his various affairs, although the active management of the business of the company is in the hands of his two sons, A. A. Cooper, Jr., and Wm. F. Cooper.

TIMKEN BUSINESS SHOWS BIG GAINS

The business of the Timken Roller Bearing Co., Detroit, Mich., shows an increase of 120 per cent. for October over the same month's business in October, 1914, and an increase of 25 per cent. over the business of September, 1915, according to Herman Ely, secretary of the company. This increase is not due to war orders but to the natural increase in car manufacturers' business.

NATIONAL SHOW COMPANY OFFICERS

The directors of the National Implement and Vehicle Show held their annual meeting at Peoria, Ill., November 16, and elected the following officers for the ensuing year: President, Warren Sutliff; vice-president, Theodore Kuhl and Lee R. Turner; treasurer, M. X. Chuse; secretary, W. O. Ireland.

CHANGES IN HAYES WHEEL CO. OFFICIALDOM

W. C. Morrey, manager of the timber department of the Hayes Wheel Co., Jackson, Mich., has been promoted vice-president, while William C. Snyder and H. D. Hartley, Piqua, O., have become members of the board of directors. The company's capital stock was recently increased to \$1,000,000.

BROCKWAY TRUCK ADDS TO PLANT

The Brockway Motor Truck Co., Cortland, N. Y., has purchased nearly an acre of land east of its present plant and has begun work on the foundations of a new building 186 ft. long and 40 ft. wide. The second building will be added in the spring. The buildings are of concrete block.

S. O. FRANTZ ELECTED REGISTER OF WILLS

S. O. Frantz, of Roherstown, Pa., well known to the trade as the manufacturer of the New Idea buggy seat, was elected Register of Wills for Lancaster county, Pa., at the recent election.

WILL BUILD BUGGY PLANT

The Robinson-McGill Co., of Nashville, has purchased a lot in Fayetteville, Tenn., and will begin the erection of a buggy plant. A two-story brick building will be put up and used as an assembling house.

OBITUARY

Edward Reichard, a well known carriage maker, living at 222 Fourth avenue, Dayton, O., died October 15, after a year's illness from Bright's disease. He formerly lived at South Bend, Ind., having been forced to retire from active labors on account of affliction shortly after moving to Dayton. He is survived by his wife and a brother.

Edward K. Rowland, 45, vice-president of the firm of William & Harvey Rowland, Inc., manufacturers of carriage springs, in Philadelphia, dropped dead of apoplexy at the Stratfield Hotel, Bridgeport, Conn., November 23. Mr. Rowland was graduated from the University of Pennsylvania in 1891, and during the time spent at the university he was noted for his interest in outdoor sports. He was a member of the Philadelphia Club, Philadelphia Country Club, Society of the Sons of the Revolution and the Radnor Hunt Club. His estate at Radnor is one of the most beautiful in that section and Mr. Rowland spent much of his time in planning improvements. Mr. Rowland is survived by his widow and two children.

Alfred J. Walker, 73, who was a well known manufacturer of automobiles and carriages, with a plant at Tompkinsville, Staten Island, N. Y., for over 40 years prior to his retirement, died at his home 193 Van Duzer street, Tompkinsville, December 3. He was born in England. He is survived by a widow, a son and two daughters.

TO DOUBLE PRUDDEN PLANT

It is reported in Lansing, Mich., that the W. K. Prudden Co., which is one of the biggest automobile wheel manufacturers in the country will double its plant, and possibly erect an entirely new one. This concern's business has increased steadily during the past twelve months, and it is a necessity with it to enlarge at once as otherwise it will not be possible to take care of the increased business.

EIGHT THOUSAND PACKARD TRUCKS SOLD

In ten years Packard motor trucks to the number of 8,000, valued at about \$20,000,000, have been sold, according to C. R. Norton, truck sales manager of the Packard Motor Car Co. These figures do not include trucks sold for export. The money invested in Packard trucks is cited as proof of the great value to modern business of power vehicles. That the service of trucks has been very satisfactory and economical is shown by the fact that a greater part of the machines sold have been repeat orders.

W. E. LANE WITH BROWN CO.

The Brown Carriage Co., of Cincinnati, O., announces the appointment of W. E. Lane as representative in Iowa. Mr. Lane was formerly a traveler in Indiana for the Staver Carriage Co., of Chicago. Before going with the Staver people he traveled in Iowa for the Parry Mfg. Co., of Indianapolis, Ind., and later for the Durant-Dort Carriage Co., of Flint, Mich. Mr. Lane will sell both the Brown and Staver lines, the latter, as recently announced, having been purchased by the Brown Carriage Co.

GARFORD MEN STUDY WORM DRIVE

Fifty Garford truck owners and the Garford organization in eastern Pennsylvania gathered at the Garford Philadelphia company's salerooms at Philadelphia, Pa., recently for a study of the worm drive. They were addressed by E. A. Shelley, advertising manager of the Sheldon Axle Co.

INCREASED ITS VEHICLE TRADE

The Morrissey Carriage Co., manufacturing and retail vehicle industry at Denver, Col., has made an increase of 15 per cent. in its business this year over last, and while the demand for carriages proper is not what it used to be the company devotes more attention to the manufacture of light wagons for city delivery, and farming and farm implements.

BOUGHT BIG HICKORY TRACT

T. W. Minton & Son, manufacturers of wagon and vehicle woodwork, at Barbourville, Ky., have closed a big deal for several hundred acres of hickory timber to be cut and shipped from Bell county, Kentucky, in the vicinity of Pineville. The company is very busy, and is making preparations to operate full time for several months to come.

WANTS

Help and situation wanted advertisements, 1 cent a word; all other advertisements in this department, 5 cents a word; initials and figures count as words. Minimum price, 30 cents for each advertisement.

PATENTS

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The 1915 Edition

An extra painstaking revision of the names (and other information as below) constituting the Retail Harness Trade, has been completed for this year's issue of the Directory, and we think the work is so important and worthy that the

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Just a Sketch of Its Contents

The list of the **WHOLESALE** and **JOBGING TRADE** is so arranged as to make it convenient to separate the association members from those not so recognized.

The **RETAIL HARNESS MAKERS** of the United States and Canada comprise the principal part of the Directory, arranged by State, Town and County, and in the large cities, the street and number is given. Those rating (approximately) over \$1,000 are marked.

A list of **HARNESS DEALERS** as distinguished from retail harness manufacturers, is also given. The value of this list to those who solicit the vehicle, implement, hardware and department stores will be readily appreciated.

A list is also published of Export Commission Merchants, giving the class of merchandise they handle.

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THE TRADE NEWS PUBLISHING COMPANY

PUBLISHERS OF "HARNESS"

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CHARLES L. DOWLER

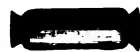
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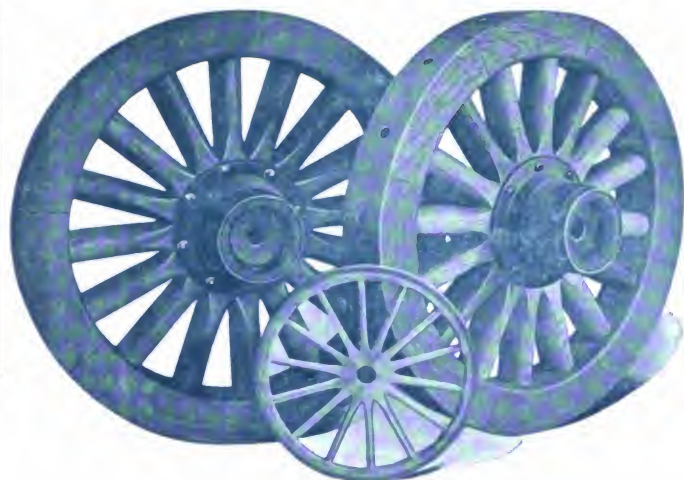
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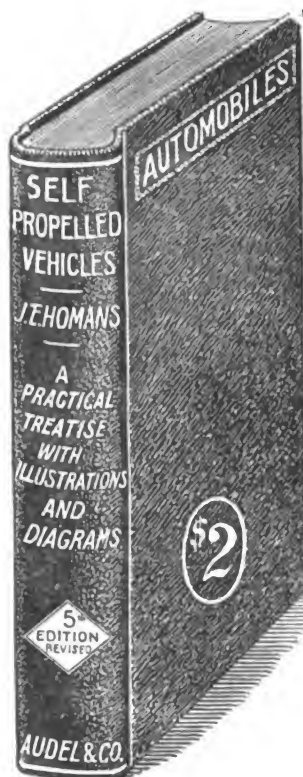


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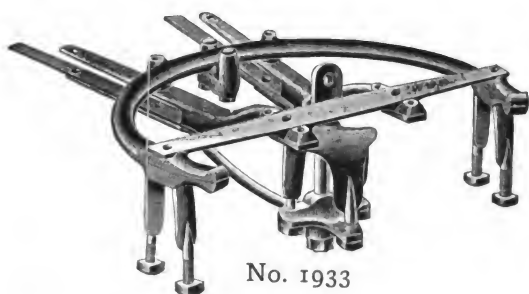
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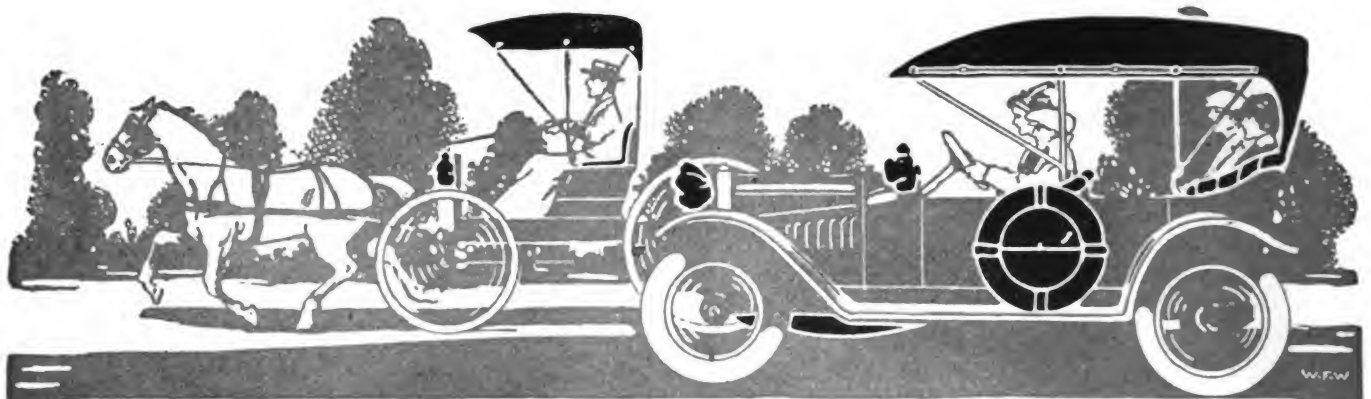
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The Hub

Vol. LVII

JANUARY, 1916

No. 10

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THE HUB is published monthly in the interest of employers and workmen connected with the manufacture of Carriages, Wagons, Sleighs, Automobiles and the Accessory trades, and also in the interest of Dealers.

Subscription price for the United States, Mexico, Cuba, Porto Rico, Guam, the Philippines, and the Hawaiian Islands, \$2.00; Canada, \$2.50; payable strictly in advance. Single copies, 25 cents. Remittances at risk of subscriber, unless by registered letter, or by draft, check, express or post-office order, payable to the order of THE TRADE NEWS PUBLISHING CO.

For advertising rates, apply to the Publishers. Advertisements must be acceptable in every respect. Copy for new advertisements must be received by the 25th of the preceding month, and requests to alter or discontinue advertisements must be received before the 12th day of the preceding month to insure attention in the following number. All communications must be accompanied by the full name and address of writer.

FOREIGN REPRESENTATIVES:

FRANCE—L. Dupont, publisher of *Le Guide des Carrossiers*, 78 Rue Boissiere, Paris. Subscription price, 15 francs, postpaid.

GERMANY—Gustave Miesen, Bohn a Rh. Subscription price, 12 marks, postpaid.

ENGLAND—Thomas Mattison, "Floriana," Hillside avenue, Bitterne Park, Southampton. Subscription price, 12 shillings, postpaid.

Entered in the New York Post Office as Second-class Matter

A Great Year in Motordom

In 1915, 892,618 motor vehicles were sold in the United States. Their retail value was \$691,778,950. For the last fiscal year ending June 30, the total retail value of motor vehicles sold amounted to \$625,000,000.

To show how this output has climbed up in a short span of years, the value of cars produced in 1899 was \$4,750,000, the total number of cars that year, 3,700. In 1903 the production of cars had risen to 11,000, with a value of \$12,650,000. It was not until 1910 that production on anything like the great scale of today began to show itself. That year the number of cars produced mounted to 187,000. A leading factor in this gain was standardization of the most important parts, which took definite shape in 1910.

Evidence of the abounding energy contained in the industry is the way the future is faced. Almost before one year's totals are known, attention swings forward to the next year. How much can production be increased next year? What will the end of 1916 show?

Estimates vary. There are none under 1,000,000 cars, and 1,500,000 is the upper limit of well-considered predictions. Alfred Reeves, general manager of the National Automobile Chamber of Commerce, in a statistical summary, states that the production of 1916 will be in excess of 1,200,000 cars. As to succeeding years Mr. Reeves adds: "On the basis that any person with an income of \$1,200 can own a car there is a market for automobiles to the number of 5,000,000.

In the production of 1915, passenger cars, as is to be expected, form a great part of the total. These numbered 842,249, with a retail value of \$565,855,450. Different kinds of records of 1915 are equally luminous. Thirteen million barrels of gasoline were consumed by automobiles last year, an increase of 3,000,000 barrels over the previous year. The number of tires used was 12,000,000. Lubricating oil consumed amounted to 28,000,000 gallons. The number of miles traveled by automobiles in 1915 is placed at 12,000,000,000. The total registration of machines was 2,400,000. The number of freight carloads of automobiles shipped in 1915 was in excess of 200,000. Registration and license fees in all states amounted to \$14,000,000 in 1915.

The average price of the passenger cars in 1915 was \$672. The average price in 1899 for steam runabouts was \$1,284. In 1907 for gasoline cars it was \$2,123.

Other expressions of the distribution of automobiles are: Proportion of motor vehicles to population of the United States, 1 to 48; to miles of road, 1 to 1; to area of the United States, 1 to 1 1/3 square miles.

The total number of manufacturers of passenger and commercial cars is 448. That all is not profit in the industry—that keen and eliminating competition exists—is shown by the fact that there were 40 failures in the industry in the last four years. The automobile factories of the country are distributed through 34 states.

A commanding feature of the year was the export trade. It went forward at a great bound. Automobile exports to 80 different countries in 1915 amounted to \$100,000,000. In 1914 it was \$28,507,464, an increase of 250 per cent. The estimated value of the exports of commercial vehicles only was \$63,000,000, an increase of 600 per cent. The estimated value of the export of passenger cars was \$37,000,000, an increase of 90 per cent. Seven hundred and fifty motor cars it is estimated leave the port of New York every week for Europe.

England is the best buyer of automobiles from the United States. For the fiscal year ended June 30, England's purchases amounted to: Trucks, 5,306; pleasure cars, 8,321; a total value of \$21,000,000.

All in all it has been a great year—and this year is expected to be a better.

Shortage of Materials

The scarcity of materials is becoming apparent. It is said that manufacturers of motors and parts in and around Milwaukee are apprehensive of a serious shortage of aluminum and report that already there is a necessity for returning to the use of cast iron parts because of the soaring prices and the added difficulty of getting a sufficient supply. A shortage of high-speed steels is also reported and the restricted supply of tool steels, coupled with greatly increased prices, may prove a hardship during the coming year.

There were 74,000 trucks produced in America last year, one-third of which were exported.

Government Attitude Toward Business

While the interviews with the Attorney General, the Federal Trade Committee believes, need no interpretation, the committee offers the following summary thereof:

Persons entering into transactions in good faith, having good cause to believe them lawful, will not be criminally prosecuted, but if their business be found violative of the law, they will be given opportunity to readjust in conformity with the law without legal proceedings, unless consent decree in a civil suit is desired.

The Department of Justice intends to give substantial recognition to the provisions of paragraph (E) of section 6 of the Federal Trade Commission Law, which authorizes the Commission

"Upon the application of the Attorney General to investigate and to make recommendations for the readjustment of the business of any corporation alleged to be violating the anti-trust acts in order that the corporation may thereafter maintain its organization, management, and conduct of business in accordance with law."

"In cases as to which both the Department of Justice and the Federal Trade Commission have jurisdiction, such for example as those arising under the Clayton Act, the Department will await the conclusion of the Commission's proceedings as to any matters in which the Commission's jurisdiction is first invoked.

"It is not improbable that the working arrangement between the Department of Justice and the Federal Trade Commission is to follow along the same lines as have been established by custom as between the Department and the Interstate Commerce Commission with relation to violations of the Act to Regulate Commerce, as a result of which arrangement the Department rarely, if ever, institutes proceedings without the recommendation or sanction of the Interstate Commerce Commission."

N. A. C. C. Cross Licensing

One of the most important events that occurred during show week in New York City was the formal enforcement of the cross-licensing patent agreement among the members of the National Automobile Chamber of Commerce, Inc., which agreement went into force on Friday, January 7.

Eighty of the 97 members of the chamber have signed this voluntary agreement, agreeing to give to the other 17 members of the chamber shop rights on their patents. Also gives them six months in which they can enter into the agreement and share in the privileges.

The N. A. C. C., through its patent department, has examined and verified 353 patents controlled by the 80 companies. It is anticipated that well over 500 different patents will be represented in the cross-licensing agreement.

The scheme does not mean that all patents owned by the 80 companies signing the agreement are pooled among the companies and shop rights granted, but that patents are divided into two classes as follows:

Class A—Fundamental and basic patents, and particularly fundamental patents on motor trucks. These patents are not included in the cross-licensing agreement in that the purpose of the agreement is not to take away from any concern the value of basic and fundamental patents.

Class B—Patents relating to the general development of the industry are covered in the agreement. These patents have more to do with detail inventions rather than basic or fundamental patents.

Protecting Leaf Springs

Simple and effective is the remedy which a British inventor suggests against the frequent clogging of dirt and dust between the leaves of automobile springs. It consists of "gaiters" strapped over the springs—two gaiters to each spring. Cars, provided with such gaiters, have been run for a year under trying weather and road conditions and their springs have been found in excellent shape at the end of that time, without lubrication or other attention during the year. This is but an adaptation of the foot that has been used on universal joints and other exposed parts and is not protected by patent, and any motorist may take advantage of the inventor's ingenuity by making, or having made, his own protectors.

Railroad Petitions to Regulate Truck Lines

The Western Association of short line railroads has petitioned the California Railroad Commission to regulate the Wichita Transportation Co., which operates a freight and passenger truck line between San Diego and Imperial Valley, claiming that the truck line subjects the short line railroads to prejudice and disadvantage causing them great loss by reason of unreasonable differences in charges and fares. It also claims that as the truck line carries passengers and freight, it is a common carrier and subject to the public utilities act, and that it should register under that act. This is the second truck line that has competed so effectively with railroads as to compel them to ask for aid.

An Example of Specialization

The superintendent of an automobile factory in Indiana was interviewing an applicant for a job.

"Have you ever had any experience on automobile work before?"

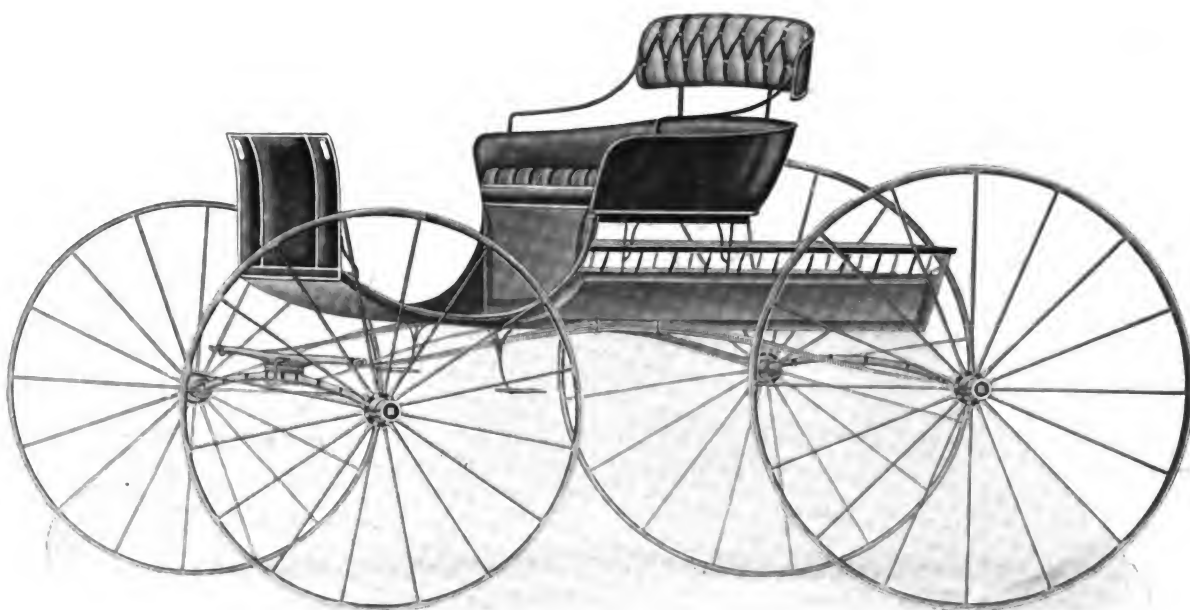
"Sure! I worked for the Ford Motor Co. for three years."

"That sounds good. You ought to know something about automobiles then. What department did you work in?"

"The assembling department."

"Well, that's all right, but tell me something about the work you did."

"Oh, I gave nut No. 16 two turns on its stud."—Machinery.



HAPPY IDEA OPEN BUSINESS WAGON
Built by Luth Carriage Co., Cincinnati, O.



AUTO SEAT BUGGY
Built by D. M. Sechler Imp. & Vehicle Co., Moline, Ill.



SOUTHERN TWO-IN-ONE BUGGY—WITH SOLID BENT PANEL SEAT
Built by Luth Carriage Co., Cincinnati, O.



TRIPLE AUTO SEAT BUGGY—EQUIPPED WITH THE NEW ELECTRIC CARRIAGE LAMPS
Built by Mifflinburg Buggy Co., Mifflinburg, Pa.

The 1916 Automobile Show

Numerous Multi-Cylinder Cars the Striking Feature—Exhibits Valued at Over \$3,000,000

The Sixteenth National Automobile Show, which was opened Friday afternoon, December 31, at the Grand Central Palace, in many ways was the most remarkable exhibition ever held. Eighty-seven manufacturers of complete automobiles exhibited more than 300 different models, from tiny roadsters to luxurious limousines seating as many as nine passengers. Between these two types there was a variety of vehicle affording the widest opportunities of selection. The value of the exhibits exceeded \$3,000,000.

The most noticeable feature of this year's show, aside from the general reduction in prices made possible by the standardization of manufacturing operations, was the prevalence of the multi-cylinder car. There were many twelves on view, in addition to an increased number of eights. This indicates more than a mere mechanical change. Multi-cylinders and electric transmission each serve the end of flexibility—that is to say lack of gear shifting. This not only makes driving much easier and pleasanter for the average man but opens far more widely the field of the gasoline car to the woman driver. It may be said, indeed, that the popularizing of the gasoline machine for women which began with the introduction of the electric self-starter has culminated in the present season. There are now a score of cars on the market which it is possible to drive, with no strain on the mechanism, at from three to fifty miles an hour without gear shifting.

More flexibility is not confined this year to the many cylindered types. By lightening the reciprocating parts, a better general balance in motors, and the increased use of the long-stroke, small-bore, high-speed type of engine, sixes and fours, have also been given a wider speed variation in high gear.

Light weight is an important feature of the 1916 season. The reductions of last year have been carried still further. This cutting of weight ranges from 10 to 1,000 pounds, according to the machine.

To the laymen the more apparent improvements are in the design and construction of bodies. Particular attention has been paid to making bodies that will seat more persons with more comfort. This is true of the enclosed car, touring car and roadster. Divided front seats have had much to do with making these improvements possible.

There were shown this year a great number of roadsters which, while they preserve their racy appearance, have seating capacities for three, and in some cases four persons. In these models, in the majority of instances, there is but one set of doors. Riding in these models is much more comfortable than in the older types, particularly where all the passengers are brought between the axles, and sociability is promoted by the enclosure of all the seats under one top. No longer does the third passenger

sit on the rumble, cut off from communication with the occupants of the front seat.

There is also an increase in the use of divided front seats in touring bodies. This is often accompanied by fewer doors.

The collapsible and demountable tops are in marked favor, both for the five and seven passenger types, and for the smaller roadsters and coupes. The demountable top has made the year-round car more of a reality. It was one of the strong points in selling cars during the holidays. As might be expected the inside drive has lost none of its popularity, and many attractive sedans with a light superstructure have been brought out. Smaller types in which the owner does the driving under the protection of a more or less permanent top, such as the coupe and cabriolet, enjoy much popularity.

Bodies are lighter this year, thus allowing motors to accomplish more on the hills. The wide use of aluminum has contributed much toward lightening these bodies—in fact, manufacturers are using this metal in various parts of the car to a greater extent than ever before.

Much attention this year has been paid to luggage space. In the three-passenger roadsters, for instance, a convenient baggage compartment is to be found behind the driver's seat, which is staggered forward to give him elbow room.

In the case of seven-passenger bodies the extra seats are more neatly handled than ever before. In some cases they are concealed in the backs of the front seats by sliding wooden rollers, for all the world like the top of a roll-top desk, or by curtains. Swivel seats are noted in several models and the occupants of these cars are enabled to face in any direction.

Decorations have reached a higher plane, if possible, than last year. Upholstering has been improved and comfort on a scale undreamed of in the early days of the industry is now provided in even the low-priced lines.

The prevalence of the double cowl has provided a chance for the insertion of many useful lockers for small articles such as goggles, veils, and maps. This form of design has also added materially to the smooth appearance and the artistic lines of the car. Plenty of wheel base, ample interior body room and in some cases adjustable seats and foot pedals make for the comfort of the user. It is emphatically a comfort year.

This effort to add to the comfort and the convenience of the car is actively in evidence in the accessory field. There are new devices for heating the enclosed car, for locking the car, auxiliary shields for driving in the snow, levers designed for quick lifting, a cigar shield to prevent the wind from extinguishing the driver's cigar, hat holders, camping outfits and so on through a long list.

The show at the Palace contained a greater number of cars, and more value for the money, than were ever exhibited before. This was true of all classes of automobiles, and notably so in the case of the lower priced ones. For instance, the man with \$1,000 to spend can obtain more for his money than ever before. The prices range through a wide scale. Of the catalogued cars the highest priced machine in the show calls for \$5,900. A roadster for \$395 is the least expensive.

The accessories on the third and fourth floors attracted thousands of spectators. There were more than 300 exhibitors of these parts and sundries, many of the devices offered appearing for the first time. Of special interest are improved designs in magnetos, carbureters, castings, electric brakes and patent lubricators.

The setting for the show was christened "The Palace of Motoria" for the goddess that the industry has created to watch over it. Statues scattered about the exhibits showed the goddess standing with hands grasping a steering wheel and with her draperies blown by the breezes. In making an abode worthy of the goddess the show management used 25,000 yards of maroon velvet hangings, decorated with festoons of deep blue and gold. Great chandeliers made it easy for the spectators to examine the smallest details of the cars.

The Salon

The automobile salon at the Hotel Astor was not confined to foreign cars this year but was rather an exhibition of the last word in body and engineering refinement.

The foreign cars contained nothing new in design. The Peugeot, Rolls-Royce, Lancia, Delauney-Belleville were on exhibition and in addition an English Daimler with a town body by Henry Labourdette, of Paris.

A Cadillac eight chassis fitted with a Berline design was shown by the Holbrook Co., body makers of New York City. Healy showed several bodies on Locomobile chassis. Bender & Robinson, who manufacture the regular Singer bodies, exhibited two special designs. In addition to these were a Packard with a landaulet and a White with a landaulet, Daniels, F. P. R. Simplex-Crane, Brewster-Knight and Owens-Magnetic.

The absence of the instrument board was noticeable, the line of instruments in many cases being placed in a neat setting at the toeboard. The practice of placing of additional clock and speedometer in a second cowl in the tonneau is growing. The other extreme was shown in the Simplex-Crane where a most elaborate cowlboard was exhibited, every conceivable type of instrument being arranged on the board before the driver, including, from left to right, a voltmeter, clock, air pump, switch block, carbureter adjustment, gasoline gage, ammeter, speedometer and odometer.

The convertible body was very much in evidence in the Salon. Some of these can be made into a limousine, landaulet or touring car, a good example being a Healy body on a Locomobile chassis, known as a touring limousine, where the glass sides fold into the body and the pillars supporting the limousine roof drop into the lines of the touring car so neatly that it is difficult to see in either case how it can be done.

Healy also exhibited a five-passenger sporting model in which, although the front seats are not divided, there is no door for the rear compartment. A slight push on one

of the forward seats opens a passage to the rear, the absence of the rear door adding to the strength and lightness of the body.

Many ingenious methods were exhibited for concealing extra seats in the seven-passenger cars. In the Singer bodies these slide into the front of the compartment folding into the back of the front seats, being covered by a shutter.

A good example of a folding rear deck was shown in the Bender & Robinson special roadster. When the rear compartment is folded open an upholstered seat with upholstered arm rests is provided and when closed the flat deck of the roadster conforms exactly with the ordinary lines of a two-passenger car.

Exhibitors in Palace Show

The full list of cars on exhibition in the Grand Central Palace follows:

Gasoline Cars		
Abbott	Haynes	Oldsmobile
All Steel	Herff-Brooks	Overland
Allen	Hollier	Owen
Apperson	Hudson	Packard
Argo	Hupmobile	Paige-Detroit
Auburn	Inter-State	Paterson
Austin	Jackson	Pathfinder
Baker	Jeffery	Peerless
Briscoe	King	Premier
Buick	Kissel	Pierce-Arrow
Cadillac	Kline	Pullman
Case	Lexington-	Regal
Chalmers	Howard	Remington
Chandler	Lescina	Reo
Chevrolet	Locomobile	Saxon
Champion	Lozier	Scripps-Booth
Cole	Maxwell	Standard
Crow	McFarland	Stearns
Cunningham	Mercer	Sterling
Davis	Metz	Studebaker
Dodge	Mitchell	Stutz
Empire	Moline	Sun
Eger	Moon	S. G. V.
Ferguson	Mutual	S. J. R.
F. I. A. T.	Marmon	Velie
Franklin	National	Westcott
Grant	Oakland	Winton
Electric Cars		
Anderson	Milburn	Waverley
Baker	Ohio	Woods
	Rauch & Lang	

Price Reductions in Five-Year Period

The scaling down of motor car prices in the last five years is shown in the following table:

Name of Car	Year	Cylinders	Wheel Base	Price
Apperson	1911	4	114	\$2,100
	1916	6	128	1,485
Buick	1911	4	106	*1,150
	1916	6	115	+985
Buick	1911	4	116	*1,850
	1916	6	130	+1,485
Cadillac	1911	4	116	1,945
	1916	8	122	+2,080
Case	1911	4	112	1,850
	1916	7	120	+1,090

Solving Future Fuel Problem

The question as to what is going to happen in the oil industry when gasoline gets up around 25 cents a gallon and stays there is arousing a great deal of speculation on the part of oil dealers. Will it still be used for auto fuel as extensively at present? Will automobile engines be devised to use some other form of petroleum product for fuel? Or will something else happen?

How about the development of kerosene carbureters to the point where pleasure cars can use this form of oil and require as little care in running as when they are burning gasoline? The National Petroleum News canvassed many automobile engineers and carbureter manufacturers as to this possibility. Here are some of their views:

Automobile engineers—that is, the majority of them—frankly and candidly pass the buck to the oil men when the question of the development of automobile engines for pleasure cars to operate successfully and to the satisfaction of the owners on kerosene is brought up. Their stand is that the placing on the market of the multiple-cylinder electric-starting cars calls for even a more volatile grade of fuel than the average gasoline sold now, to get the best service from a car.

Their remedy for high-priced gasoline is the discovery of methods by which a greater yield of this particular grade of petroleum can be obtained from the crude oil. They ask the oil man to make a few magic passes with his hands and present to an admiring world such a discovery. The processes announced by various oil chemists they regard as forerunners of a commercially successful process, which will put gasoline prices back where they were a year ago.

On the other side of the fence, however, are many of the carbureter manufacturers, who assert that not only is it possible, but that kerosene carbureters which will provide a fuel mixture and will run a pleasure car efficiently are now on the market. Looking into the future of probable higher prices for gasoline they predict more thought and study to this end than heretofore, and the resulting development of still better kerosene carbureters. They say the only reason kerosene has not been used heretofore as fuel for pleasure cars was the cheapness of gasoline.

Kerosene is already being used to a great extent in tractors, stationary engines and marine engines. Operating conditions here are somewhat different than in engines of pleasure automobiles, however. Tractors are pulling practically all the time at a maximum load and constant speed, and are not in use for the most part when the weather is cold enough to chill an engine. Marine engines also are not subject to constant shifting of speeds that makes necessary a complex type of engine and presents fuel ignition difficulties. The consumption of fuels by these kinds of engines, however, is only a drop in the bucket to that by pleasure cars and commercial trucks, and, until engine or carbureter makers develop an engine or a carbureter which will operate on kerosene and call for as little thought and care by the owner of the car as is the case when gasoline is burned, they cannot be said to have solved the automobile fuel problem.

"No matter how high gasoline prices go, we will have to stand for them," is the cheerful view of J. A. Williams, head of the K-W Ignition Co., Cleveland. "With the

Name of Car	Year	Cylinders	Wheel Base	Price
Chalmers	1911	4	115	1,600
	1916	6	124	†1,350
Ford	1911	4	100	780
	1916	4	100	440
Franklin	1911	6	123	3,500
	1916	6	120	1,950
Haynes	1911	4	116	2,000
	1916	6	121	1,385
Haynes	1911	4	125	3,000
	1916	6	127	†1,495
Inter-State	1911	4	118	1,750
	1916	4	110	850
Jackson	1911	4	110	1,775
	1916	4	112	†985
Jackson	1911	4	120	2,300
	1916	8	124	†1,685
Kissel	1911	6	132	2,710
	1916	6	126	†2,100
Locomobile	1911	6	135	4,800
	1916	6	140	†4,400
Lozier	1911	6	131	5,650
	1916	6	132	3,250
Marmon	1911	4	120	2,875
	1916	6	136	†2,750
Marion	1911	4	110	1,275
	1916	6	120	†1,090
Maxwell	1911	4	104	*1,100
	1916	4	102	†655
Mercer	1911	4	116	2,275
	1916	4	130	††3,000
Mitchell	1911	4	112	1,500
	1916	6	125	†1,250
Moline	1911	4	112	1,775
	1916	4	118	†1,375
Moon	1911	4	114	1,675
	1916	6	118	†1,195
National	1911	4	124	2,600
	1916	12	128	†1,990
Oakland	1911	4	112	1,600
	1916	4	112	†1,050
Oldsmobile	1911	4	118	3,000
	1916	8	120	†1,295
Overland	1911	4	102	*1,095
	1911	4	110	*1,250
	1916	4	106	†750
Overland	1911	4	118	*1,600
	1916	4	114	†1,050
Packard	1911	4	123½	4,200
	1916	12	125	†2,750
Pierce-Arrow	1911	6	134½	5,000
	1916	6	142	†4,900
Peerless	1911	4	123	4,300
	1916	8	...	†1,890
Premier	1911	6	140	3,650
	1916	6	134	†2,300
Pullman	1911	4	115	2,000
	1916	4	114	†740
Regal	1911	4	100	*900
	1916	4	106	†650
Reo	1911	4	108	1,325
	1916	4	115	†875
Stearns	1911	4	116	3,200
	1916	4	119	†1,395
Studebaker	1911	4	117½	3,650
	1916	4	112	†885
	1916	6	122	†1,050
White	1911	4	110	*2,250
	1916	4	115	††2,750
Winton	1911	6	124	3,150
	1916	6	128	2,285

*Price does not include top, windshield, or any modern accessories.

†Price includes self-starter, top, windshield, demountable rims, and electric lights.

‡Slight increase this year due to cost of materials.

tendency in engine development taking the target it is at present, we should be using a fuel that would evaporate rather than vaporize. Eight and twelve-cylinder cars call for better grades of gasoline than ever before. Electric starting systems also would be impossible with kerosene carbureters, at least the type now in use, the motor not being heavy enough to heat an engine to the point where it would start on a heavy oil.

"Car owners now want an engine that will need as little care as is possible; they want to sit in their seats, press a button and move down the avenue. If a choice were necessary, I believe a man would not drive his car as much on kerosene with the extra trouble it would make him."

An engineer with the White Co., Cleveland, one of the comparatively few companies making their own carbureters, is also of the opinion gasoline would have to reach an almost prohibitive price before kerosene would be accepted as a pleasure car fuel.

"The whole question evolves around heating the engine," he stated. "On a moderately warm day an engine in one of our cars would work on kerosene, once it was started, so satisfactorily the driver would hardly know the difference. On a cold day it would be impossible. There is so much metal in the multiple-cylinder cars that a film of oil is almost like lard until the engine is heated."

There are two problems to be overcome in developing a carbureter that will work on kerosene, according to the automobile engineers who have experimented in this field. First is the lack of flexibility of this particular oil fuel. A fuel mixture of kerosene would have to be changed in its proportion with every few degrees, necessitating more or less complex construction of the carbureter designed to handle it. This lack of flexibility makes it practically impossible to start a car on kerosene; hence the majority of kerosene carbureters are so equipped that they work on gasoline until the engine is heated, further complicating their structure.

The second problem is the wide range in the boiling points of kerosene—from 200 to nearly 500 degrees—which makes it difficult to secure constant vaporizing conditions. To secure sufficient vaporization at all, it is necessary to apply heat by some means. It is generally done by jacketing the carbureter with the exhaust gases from the engine, or with hot water. Early types of kerosene carbureters broke the oil up into a spray in which it could unite with the air to form a vapor mixture by spraying it through a fine wire gauze. This does not seem to have been satisfactory, however, and now heat is almost universally used.

One carbureter man at least is working on a kerosene carbureter in which he will apply his heat to the fuel mixture and endeavor to maintain this at a constant temperature until it is introduced into the cylinder. By applying his heat to the fuel mixture rather than to the fuel itself, he hopes to get around the problem of the varying boiling points.

One device is being placed in the market now which may prove an aid in bringing out an efficient kerosene carbureter. This is a device to electrically keep an engine warm in the winter time, when the car is standing, by the use of a small motor. This might be developed, it is said, to the point where a kerosene fuel mixture could be introduced into the cylinder to start the engine.

The carbureter makers seem to think that when gasoline reaches a price of 25 cents a gallon or better, popular demand will be so pronounced for a cheaper fuel for pleasure cars that the present difficulties will be overcome in some way and an efficient kerosene carbureter developed.

There is a loss in horsepower in an engine working on kerosene, according to the statement of C. C. Bennett, of the Wilcox-Bennett Carbureter Co., of Minneapolis, Minn., whose company now markets a kerosene carbureter.

"There is a loss of about one horsepower for each 25 degrees of heat developed in the engine, according to our experiments," he stated. "As vaporization of gasoline is normally at 55 deg. Fahr., and kerosene around 110 deg., heating a 30 horsepower motor to the point where it will vaporize kerosene means that it will not develop more than 28 horsepower. At slow speeds it will be even necessary to raise the temperature to around 230 degrees to keep the kerosene in a homogeneous mixture.

"If the price of gasoline were, say, 15 cents a gallon, and kerosene 10 cents, we believe there would be little saving as compared to the annoyance of handling kerosene.

"The burning of kerosene, however, does not all depend on the carbureter, but it requires some minor changes in the engine, such as keeping the dimension of the manifold down to a point where it does not break the point of torque of the motor. This would keep the velocity of gases higher at slow speeds, which would tend to prevent condensation. There are also many other things which would have to be taken into consideration, such as spark plugs, lubricating oil, valve timing, cooling and clearance, all of which would play a part in getting a motor suitable for this work."

"Under present conditions of the modern automobile, in order that perfect combustion shall be obtained with kerosene, it is necessary to have the fuel mixture thoroughly heated at the time it is drawn into the cylinder," said J. D. Wilcox, Jr., of the Detroit Lubricator Co., "otherwise its particles will separate, leaving a deposit in the cylinder and at the same time making it very hard to start the car.

"It is also necessary, even when gasoline is used in starting, to have the kerosene heated to a much higher degree than its ordinary vaporizing temperature. This must be accomplished by heating the carbureter, with a hot water jacket or the exhaust gases."

"The operator will have to favor the carbureter when using kerosene fuel because of its lack of flexibility as compared with gasoline," said John Bird, president of the Camden Anchor Rockland Machine Co., Camden, Me., which also manufactures kerosene carbureters. "This lack of flexibility the operator can overcome in a great part. Our experience with a mixture four parts kerosene and one part gasoline has proved it is equal in developing power to straight gasoline in our carbureter on automobile motors.

"If a slight change was made in the design of the motor, so that our method of heating the fuel could be easily attached to the motor, and the length of travel for the gas after it leaves the carbureter could be comparatively short, we believe the lack of flexibility could be largely overcome."

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An Ingenious British Device to Reduce Freight Costs

In order to reduce as far as possible the freight charges on a complete car or a complete body intended for export, R. Booth, London, Eng., has patented an interesting body design.

As regards the cost of shipping a complete car or a complete body, the weight being small compared with

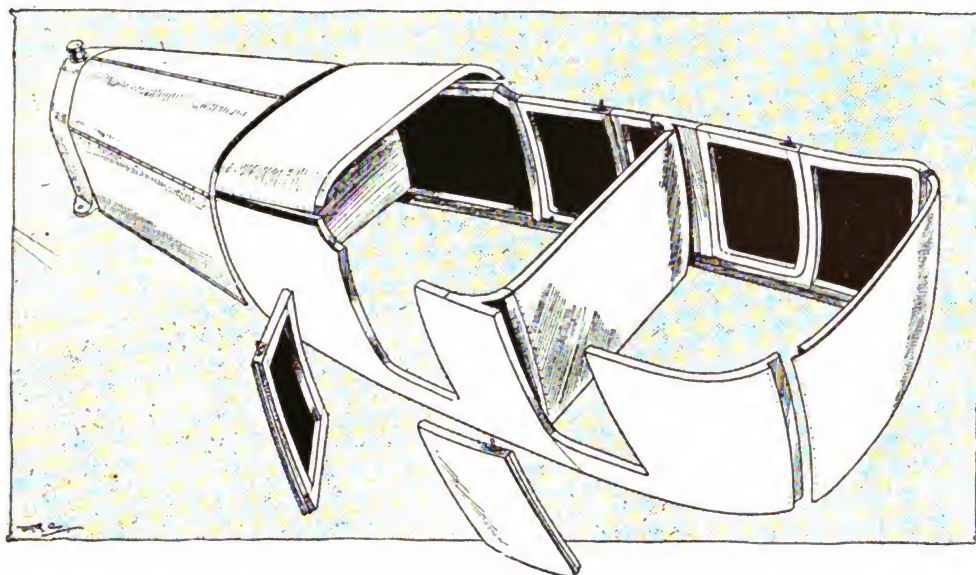


Fig. 1—A sketch of the Booth export body showing how the panels are arranged when the body is about to be completed

the bulk, the freight charges become excessive because the bulk is considerable, and therefore a very distinct saving can be made if the bulk can be reduced. Thus, for instance, in the case of Ford cars exported from America to England, it is very much cheaper to send the chassis over in parts and erect it here. The same thing applies to motor bodies, and the Booth invention consists, in brief, of building the bodies in such a way that they can be packed flat like a pack of cards, but are ready for quick and easy erection on arrival at their destination.

The accompanying illustration (Fig. 1) shows that, excluding the bonnet, the body consists of a certain number

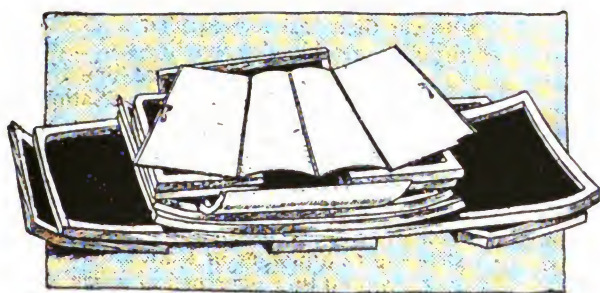


Fig. 2—A sketch indicating the principle on which the panels of the Booth body can be packed together ready for export

of panels, as follows: 1, a panel extending from the dashboard to just beyond the back of the front seat and duplicated on the other side; 2, a panel on each side from the back of the front seat to the back of the car; 3, a back panel to the front seat; 4, a back panel to the back seat; and 5, the top panel of the scuttle dash.

Now these panels are not prepared simply in the rough, but are fully prepared for erection on the basis of the body, which consists of two longitudinal ash runners carrying some of the parts. On each ash runner is built up a wood framework to which the panels are attached, or, rather, one should say, to which the panel extending from the dashboard to the back of the front seat is attached. The framework has vertical members for the door hinges and catches.

In commencing to erect the body the longitudinals are placed in position, the scuttle dash is fitted, and also the back panel of the front seats, this being screwed on to the curved verticals of the wood frame ready for its reception. Thus a two-seater body is formed. The upholstery, of course, is also detachable and is put in position last.

In the illustration Fig. 1 we have shown panelling for two extra seats at the back, making a four-seater. This panelling, however, when built up in the same way as the two-seater forward portion, is capable of removal, and for it can be substituted either a sloping tool box or a small box van attachment for carrying goods. This latter portion when complete

is readily detachable by means of wing nuts, but it should be mentioned that whether it be a tool box or a light van body, it has a forward partition of its own to prevent whatever it may contain from damaging the rear panel of the front seat.

An important point about this body construction is that it can be erected by almost anyone, skilled labor hardly being necessary. Once erected, of course, with the exception of the detachable rear portion, the body is not meant to be again dismantled.

As regards strength and appearance, the bodies built on these lines can be as handsome as any other type, while it is claimed that the strength may, perhaps, be greater. The weight, however, is slightly more than that of the ordinary kind of bodies.

There is no reason to suppose that the Booth body would be any more subject to rattle than any other kind after prolonged use, the construction when finished being solid and permanent. The hood also is ingenious, because it is made to provide protection either for a two-seater or for a four-seater.—Auto Car [London, Eng.]

New Kentucky Wagon Travelers

The Kentucky Wagon Mfg. Co., of Louisville, Ky., announces the appointment of Q. L. Florida, of Dayton, O., as representative in Indiana. Mr. Florida for a number of years was associated with the Walter A. Wood M. & R. M. Co., Hoosick Falls, N. Y., as traveling representative in western Ohio and eastern Indiana. He will carry the "Old Hickory" line to his many friends in the Hoosier state.

Why There Has Been Delay in Parts Delivery

During the past few months considerable adverse criticism has been directed against automobile parts manufacturers for their inability to fully meet the car builders' demands for finished parts. The greater part of this criticism has been grossly unjust in that it has in no way considered the very abnormal conditions which have prevailed throughout the past year and which have so radically changed even the best of plans. The sudden and unforeseen increase in the car manufacturer's requirements which the parts maker was totally unprepared to meet; the very unusual condition of the raw material market, caused by the European situation; the scarcity of competent workmen and the attending labor troubles—none of these very sufficient reasons has been allowed to leaven the censure which has been heaped upon the parts manufacturers. Each of these, however, has a direct bearing on the situation.

During the early part of 1915 the demand for motor cars gave some evidence of being above normal. The car manufacturer liberally covered for the season's requirements and the parts maker laid out his production for the year accordingly. Later, as the demand for cars suddenly gave evidence of being unusually large, orders for parts were quickly stepped up, sometimes doubled, until the parts maker was carrying orders in excess of the capacity of his plant. This in no way stopped the influx of orders. All parts makers were in the same position as to the large volume of business carried, and the car builder, knowing this, realized that his best chance for additional parts lay with his regular source of supply. Almost a deluge of continuous increases in current orders fell upon the manufacturers of parts. How he was to make deliveries was not considered. Each customer insisted that his particular demands be met and expressed perfect indifference to the requirements or needs of any other customer.

As soon as this trend of affairs showed itself, most of the larger parts makers took steps to supplement their output by the erection of additional buildings and increased machine equipment. This brought out the fact that machine tools were not to be obtained as readily as in the past. Machine tool builders were working at full capacity to take care of large orders already on their books from manufacturers of munitions of war, and additional deliveries of machines were from six to twelve months off. Then deliveries of raw and semi-raw material tightened. Deliveries of steel jumped from 30 days to two months, then three and on up in steady leaps as far as five and six months from date of order.

In addition to these trials came a scarcity of machinists. Practically all factories, large or small, felt this keenly in the curtailment of production. In many cases this scarcity of men brought with it labor troubles, demands for shorter hours with increased rates and other little internal frictions which accompany such conditions. In short, practically every obstacle which would tend to affect deliveries has been thrown in the path of the parts manufacturer in the past few months, each adding its bit toward the general slowing up of production.

It has been an unusual year. With all his troubles probably every manufacturer has materially increased his production and, if he has not attained all that has been

desired, surely there are a multitude of good reasons for not doing so.

Much credit is due some of the larger concerns which have, by the use of every force at their command, managed to surmount all obstacles and take care of their customers. No great amount of censure is due the smaller concerns which, some of them, may have failed in that which has been required of them. At least all are better prepared to care for the increased demands of the coming year of prosperity.—J. M. Simpson, in *Horseless Age*.

Gasoline Sells For \$1.06 a Gallon in Paris

Gasoline sold on November 16 in Paris for \$1.06 a gallon and in London for 47 cents, the difference being due to the fact that England is confiscating gasoline shipments destined for neutral countries, according to statements made by H. W. Workman, Cleveland, European representative of an automobile company dealing largely in war orders. He just returned from England and has spent much time in France, Russia and England since the outbreak of war.

"Any English concern that can show it is aiding in any way in the manufacture of war munitions can purchase gasoline at four cents lower than the government's listed price," Workman stated. "Private users of gasoline, however, pay an extra war tax of 12 cents a gallon the government recently assessed, making it cost them 59 cents. In Paris, however, any quotation is almost needless, for the stocks are all held by the government, and practically no gasoline is dispensed that is not used directly for military purposes.

"The only automobiles to be seen on the streets of Paris are the ambulances and occasional cars carrying officers. Regulations are not quite so strict in London."

Workman believes Germany held underground stocks of gasoline when war broke out more extensive than were even dreamed of by her enemies, and that she will be seriously handicapped when this supply is exhausted.

St. Louis Club Election

At the monthly meeting of the St. Louis Implement, Vehicle and Hardware Association, December 20, the following officers were elected for the ensuing year: President, C. F. Batchelder, of the John Deere Plow Co.; vice-presidents, E. Lucas, of the Rubelmann-Lucas Hardware Co.; J. W. Brewer, of the Oliver Chilled Plow Works, and E. L. Galt. Secretary-treasurer, George T. Michael, of the Luedinghaus-Espenschied Wagon Co.

The association made preliminary arrangements for entertaining the members of the Mississippi Valley Implement and Vehicle Dealers' Association, which will hold its convention in St. Louis, January 19, 20 and 21.

Long Test for An Electric Car

An electric delivery automobile was recently given a severe test by running it from New York to Cleveland, a distance of 733 miles, which is said to be the longest run ever made by an electric. Eleven days were required, and the total current consumption was 1,564 ampere hours. The batteries were charged 25 times, and no adjustments were found necessary, the entire distance being covered without a mishap of any kind.

Axles and Their Variations

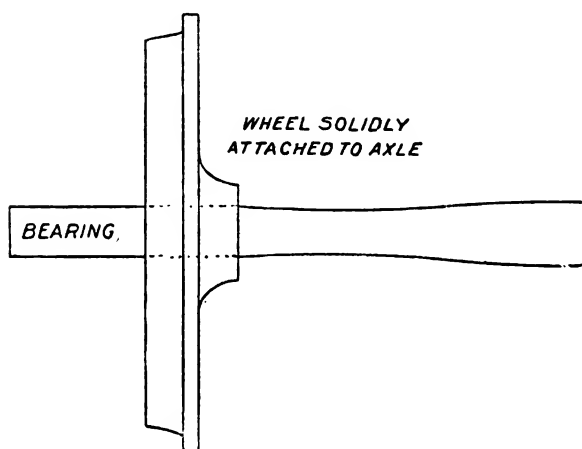
By Chas. E. Duryea

It would seem that so simple a thing as an axle could not be modified and improved until a half dozen or more varieties are now in common use and have distinctive names. This was true until the motor vehicle came into the field and introduced many methods, not only of propelling, but of getting greater strength out of the carrying parts.

The very original axle was doubtless a "live" one and exemplified by the roller the cave man put under his canoe or dugout as he pulled it out of the water. But, so far as history shows, the first extended use was of "dead" axles with wheels journaled to revolve on the ends.

The dead axle is the kind used on horse vehicles and, since it does not revolve, it can be straight or curved, that is, cranked up so the load may be hung under it, or cranked down so the load may be over it, and still not be high from the ground.

To prevent seizing and sticking and to facilitate removal the box and the spindle on wagons and carriages were



Live Axle

The wheel is secured to the axle, which turns with the wheel. This type is employed on railroad cars, etc.

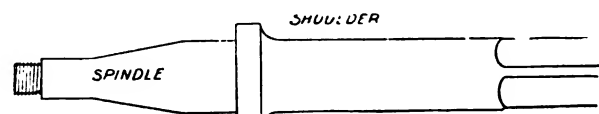
considerably tapered, instead of being parallel. If the center line of the taper was parallel with the axle line, the wheel would crowd out toward the retaining nut. Accordingly, the spindle was bent down until its lower side was parallel with the ground. This is what is known as "camber." Camber causes the wheel to lean outward at the top and partly corrects its tendency to crowd outward against the nut. The spindle end was then bent forward until the wheel would run without crowding in or out. This is called "gather."

Variations of these constructions are seen in the front axles of automobiles. But these axles differ from carriage axles in that the whole axle does not pivot in steering, only the short stub axles turning with the wheels. These constructions, however, are not seen in rear axles, except when the drive is by jackshaft and chains to the rear wheels.

The true live axle is of the railroad and trolley car kind; that is, it simply connects the wheels solidly and revolves with them. A few autos have been so made, but, except for the very lightest cars, it is not considered practical. A number of the early autos used modifications of this, having a single axle connecting the wheels and fastened

to one wheel, the other wheel being on a sleeve, which surrounded the axle at one end. One of the large balance gears was on the axle and the other on the sleeve. Usually two bearings for the springs were used and the axle was unsupported in the center, just as the railway car axles.

The defects of such axles was that, being unsupported in the center, they would sooner or later break, because each revolution caused them to spring or bend in an opposite direction and sooner or later fatigued the metal and



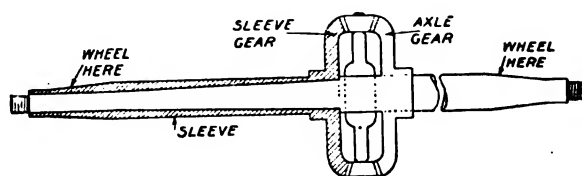
Dead Axle

The wheels revolve on the axle ends, the axle being stationary. This type was used on double chain drive models.

finally broke it. The dead axle is not open to such alternating and opposite stresses. It will spring down until its fibers get under sufficient stress to carry the load and there it will hold with safety.

Designers early recognized such a defect and, in spite of added cost, designed to avoid it. The axle evolved combined the supporting qualities of the dead axle and the freedom from bending strain of the live type. This combination was originally termed "floating," because the revolving portion floats, or is carried, by the other portions, without carrying any of the load itself; it is now termed "full floating" to distinguish it from other forms that more or less nearly approach it.

The full floating type may be briefly described as being a hollow dead axle, on which hollow portion the wheels are journaled and in which the balance gears are mounted, usually in a casing and on bearings. Connecting the large balance gears with the wheels at their outer hub ends are the live portions of the axle. These may be square or with squared or splined ends. They carry no load, they do not even hold the wheels in place and are usually made so they may be withdrawn and leave the wheels just as firmly mounted as when the shafts are in place. In short, these removable half axles perform no function except that of turning the wheels with the power they receive



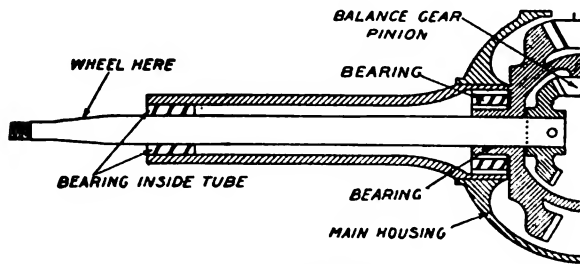
An Early Design of Live Axle

The shaft extend all the way through; one wheel being connected to the shaft and the other to the sleeve, which surrounds one side of the shaft. This form was seen on models having a single chain drive to the rear axle.

from the balance gears. They have no end strains, for the wheel bearings take such. They are usually more or less flexibly attached to the wheels and thus do not even take the bending strain caused by skidding sidewise. They are therefore perfectly free from breaking and, should the hollow dead axle break, they could support the load until they slipped out of place, at any rate.

Another form which has come into very large use is a sort of combination of the dead, the live and the floating.

Partly to distinguish it and partly to get some of the recognized advertising value of the floating, it is called "semi-floating." In this form, the hollow dead axle extends to, but not into the wheels. The live axle is made in two equal parts, as in the floating type, but is fixed into the wheels at one end and into the large balance gears at the other end. These live portions are supported in

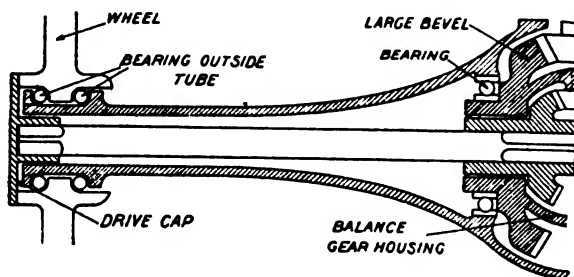


Semi-Floating Axle

The wheels are attached to the drive shafts, which have a bearing inside the axle tube. This results in the drive shaft supporting the weight of the car, as well as driving the wheels.

bearings, one being at the end of the hollow portion commonly called the axle housing and other near the balance gears. It will thus be seen that the dead portion takes the strain which tended to break the true live axle at its middle. Also, that being held in bearings as close to the wheel as possible, the load becomes a shearing strain, rather than a bending one. This practically does away with the cumulative damage of the alternating stresses that in time were practically certain to break the live axle. It is, however, exposed to the bending strains due to skidding against the curb and these may break it in time. All things considered, it is one of the best forms. It is questionable if the advantages of other forms compensate for the costs over this form.

Besides these well-defined forms there are some modifications peculiar to one or more makers that are described as more nearly like the full-floating type than is the semi-floating, and it is customary to term these "three-quarter floating," although "five-eighths" and "seven-eighths" floating are sometimes mentioned. The most general usage



Full-Floating Axle

The wheels have bearings on the axle tubes, so that the only function of the live shafts is to rotate the wheels. The shafts can be withdrawn without removing the wheels.

seems to be that the term "three-quarter" means that the wheels are attached to the axle just as in the semi-floating, but that the bearing, instead of being inside the dead portion and on the live portion, is a single or short bearing outside the dead portion at its end and inside the end of the wheel hub.

In other cars, the balance gears are in a case or housing at the center, which housing is supported on bearings of its own and the inner ends of the axle halves are sup-

ported therein, without any bearing. This form finds favor because it offers a splendid support for the bevel gear set and is quite generally termed a "three-quarter" construction. A combination of the two would seem to constitute a "seven-eighth" construction and the maker, who has some modification of the semi-floating, may be excused for calling it a "five-eighths."

The practice is not yet sufficiently fixed to permit certainty in the matter of names for these slightly varying constructions. As the making of axles becomes a specialty, it also becomes more standard and in time the terms will be applied more accurately than is the case today. Not only is the user in doubt, but also the maker as to what term to use; and, while some makers lean toward terms that they do not merit, others do not get credit for their construction, because they use the wrong term.—Automobile Trade Journal.

Where the Automobile Makers Are Located

California	13	New Jersey	10
Colorado	3	New York	60
Connecticut	7	North Carolina	1
Delaware	2	Ohio	52
Georgia	1	Oklahoma	1
Illinois	47	Oregon	2
Indiana	45	Pennsylvania	35
Iowa	6	Rhode Island	1
Kansas	3	South Dakota	1
Kentucky	3	Tennessee	3
Louisiana	1	Texas	3
Maine	1	Utah	1
Maryland	4	Virginia	1
Massachusetts	17	Washington	6
Michigan	85	West Virginia	1
Minnesota	15	Wisconsin	14
Missouri	16		
Nebraska	1	Total	448

Will Finance Buying of Motor Trucks

The Acceptance Corporation, 55 Liberty street, New York City, has opened a new department for the purchase of notes taken in part payment for motor trucks. By this plan the truck dealer can now accept notes in part payment for a truck which the corporation agrees to buy from him, and thus the dealer can pay the truck manufacturer cash for his product, and be enabled to get the concessions, discounts and freight allowances usually made to cash customers. It will also relieve him of the bother of collecting the notes from the customer, or financing any part of the transaction.

The company includes on its board of directors many well known bankers and men of prominence in the automobile field, including R. M. Owen, Roy A. Rainey, Robert H. Montgomery, Henry Bennett Leary, John Farson, Richard H. Swartout, E. D. Bird and David B. Mills.

Ford Employs 35,000

In round numbers there are more than 25,000 men regularly employed in the plant of the Ford Motor Co., Detroit, including superintendents, foremen, inspectors, etc., and about 600 of the office staff. Ten thousand more are employed in the 50 branch factories and service branches.

Will Double Auto Production in 1916

Some idea as to the increase in the use of automobiles in this country in 1916 is to be gained from advance reports as to the 1916 production of the four motor car companies whose stocks are listed on the New York Stock Exchange. These production figures were estimated on the basis of present production and do not include what increases in output may be made this year.

At the rate of its present performance the General Motor Co. will make 100,000 cars in 1916, as compared with a production of 76,000 cars in 1915. The Willys-Overland Co., it is said, will turn out close to 200,000 cars in 1916, as compared with a production of only 90,000 cars in 1915; 100,000 of these being of the new low-priced model recently announced, to turn out which their new factory at Toledo was built. The Studebaker people, it is estimated, will make 75,000 machines, while their output for all 1915 did not exceed 40,000 cars. The Maxwell people are running at the rate of 60,000 cars a year, which figure will undoubtedly be maintained in 1916, barring such unforeseen factors as serious labor troubles or inability to secure enough materials.

Not all this production will be marketed in this country, as some of this total output of 335,000 cars among four companies only will go to fill war orders.

Although these companies are selling their cars at lower prices, it is estimated, if present schedules are maintained, profits per share will be greater than in 1915, when they averaged nearly 50 per cent. on outstanding stock for the four companies.

Orders for 21,382 of the Chalmers Motor Co., Detroit, Mich., new six-30s were placed in three days by Chalmers agents at a recent convention in Detroit. This is more than the capacity of the plant for the first six months of 1916, which is estimated at 18,000 cars.

The Autocar Co., Ardmore, Pa., has increased its capital stock from \$1,000,000 to \$2,000,000 to provide for doubling its output of trucks.

The Hupp Motor Co., Detroit, has increased its capital stock from \$1,000,000 to \$6,500,000. Of the new capital \$5,000,000 is common stock and \$1,500,000 preferred. The new capital will be used to increase production facilities. As a part of its expansion policy, the company recently acquired the property of the American Gear Co., Jackson, Mich., where axles will be manufactured.

To provide for the increased demand for cars, the Saxon Motor Co., Detroit, has been succeeded by the Saxon Motor Car Corporation, incorporated in New York with capital stock of \$6,000,000. Former capitalization was \$350,000. The company announces its production schedule from August, 1915, to July, 1916, calls for 27,600 cars. Last year 17,000 cars were turned out.

The plant of the Buick Motor Co., Flint, Mich., is to be doubled during the year to provide for a production of 150,000 cars in 1917, double the contemplated 1916 production.

Large Sales of National Forest Timber

Bids have been accepted by the Department of Agriculture for two large bodies of national forest timber estimated to contain 188,100,000 board feet. One is in California and the other in Utah. With one exception, these are by far the most important sales made this fiscal

year, which is expected by forestry officials to run considerably above last year in receipts from timber sales, the first five months having shown an increase of nearly 40 per cent.

The California sale is on the Plumas national forest, in the Sierra Mountains. The most valuable timber is sugar pine, for which \$3.25 per thousand feet was bid, with an estimated total of nearly 26,000,000 board feet on the tract. For yellow pine, of which the amount is put at over 37,000,000 feet, \$2.50 was bid.

Douglas fir, white fir, and incense cedar, which have a much lower market value, brought an average of only about 70 cents a thousand for a total of over 43,000,000 feet. The purchaser will be allowed an operating period of 15 years, besides a year at the beginning for the construction of necessary improvements; but the prices to be paid are subject to readjustment every five years.

The Utah timber is in the Wasatch national forest, and will be cut chiefly for railroad ties. It comprises, according to the government's estimate, 82,100,000 board feet of green and dead lodgepole pine, Engelmann spruce, and Alpine fir. The sale price is 10 cents for each tie cut and ½ cent per linear foot for mine timbers.

Notwithstanding that since the current fiscal year began, July 1, there have been two large previous sales of national forest timber, one in Arizona of less than 50,000,000 feet, the other in Washington of nearly 100,000,000 feet, the vast bulk of the sales from the national forests are of small quantities for the supply of local needs. The total cut from all the national forests last year was 689,000,000 board feet, of which nearly one-fourth went to local residents allowed free use, while out of a total of nearly 11,000 individual sales only 109 involved timber worth more than \$1,000. With timber receipts during the last fiscal year in excess of \$1,175,000, the forestry officials say that if the rate of gain already made this year continues the receipts will exceed all past records.

The Traveling Men and the Registration Law

At a meeting of the Commercial Travelers' Association of the Upholstery and Allied Trades held at the Aldine Club, December 20, C. R. Clifford, of Clifford & Lawton, the trade journal publishers, made an address from which we extract the following, because important to every traveling man of our trade:

"At the preliminary meeting of this association, October 5, it was estimated that 175,000 commercial travelers forfeit their right of ballot because absent on the road registration day. They are disfranchised—they have not the status of the commonest immigrant. I have talked this matter over at some length with a member of the state legislature, and as a result I am delighted to be able to say that after proper reflection this senator will bring the matter up before the next session at Albany. He writes me that he will introduce a bill which will enable the commercial traveler to register at his convenience, and an extract from his letter is as follows:

"When this bill is introduced it will be up to you and your association to send delegates to Albany to support the measure, and you had better write me regarding this about the middle of January."

"Now, gentlemen, to secure the passage of a bill of this sort, or to accomplish any great results—to provide for

example, as the English traveling men have provided, a home for orphans, or schools like the English Pinner schools, or to do anything else that is big, we need numbers—a regiment of traveling men. To form such a regiment you have first to organize companies. The fighting character of a regiment rests entirely upon the loyalty and enthusiasm of the men in each company. You cannot make an efficient regiment out of an indiscriminate assemblage. You must organize companies first. This association constitutes one company only in the grand army of commercial travelers—the Boot and Shoe Men's Association will be another, and still other companies will be the Jewelry men, the Garment men, and so on, and when all are organized into one big regiment we will have then what we may term a concrete body—a federation of commercial travelers. Such a federation will stand for vast numbers, vast powers, because its membership will be knit together with the fraternal relationship of one big brotherhood, and will have the fighting strength to accomplish anything that is progressive, just or charitable. Now, then, I suggest to you that you not only send delegates to Albany to support this registration bill, but that you invite delegates of other associations to accompany you, and in that way you can go up there 100 strong, representatives of a big federation that will carry weight and influence."

December Meeting of C. M. C.

The Carriage Makers' Club of Cincinnati held its Christmas banquet at the Business Men's Club, Thursday evening, December 16, 100 members and guests being present. Most of the regular business routine was omitted, so as to give more time to the festivities.

Two new members, Clarence Rossiter, secretary of the Brighton Pole, Shaft and Supply Co., Cincinnati, and H. A. Carter, of the George R. Carter Co., Connersville, Ind., were admitted to membership.

The following telegram was read by Mr. Hunter:

Marathon, Fla., December 15, 1915

Mr. Theodore Luth, Cincinnati, O.:

Our party caught in heavy gale on the 13th in yawl boat while fishing for a tarpon. Blown a mile out into the Gulf of Mexico. Picked up by fishing schooner and brought to Marathon Harbor, arriving late last night. Very thrilling experience, which, much to my regret, prevents me being with you tonight. Roninger joins me in best yuletide wishes to you all, and may the hand clasp between Cincinnati and St. Louis never be broken.

P. E. Ebrenz.

Claude Shafer, cartoonist and the creator of "Old Man Grump," entertained the club with some sketches in which he caricatured some of the members, much to the general amusement.

Horace Williamson, a jingle poet of much ability, did his share to make the evening thoroughly enjoyable.

Senator Louis Pink, in a brief address, urged the club to stand solidly behind the movement for a new Union passenger station for Cincinnati.

Phillip Roettinger, a local attorney and old time carriage builder, made an interesting address, advising the carriage folks that now is the time to put their shoulders to the wheel and go after business.

Henry Ratterman, retired carriage manufacturer, and honorary member of the club, was present for the first

time in three years, having had a siege of sickness. Mr. Ratterman, always popular with the C. M. C., received quite an ovation. He gave an interesting talk, evidencing a keen understanding of the vital questions now confronting the people. His remarks were much appreciated.

Chalmers Opens School of Instruction for Employees

To assist ambitious employees, the Chalmers Motor Co. has recently inaugurated the Chalmers School of Instruction, under the direction of C. G. Arthur, well known mechanical engineer and technical writer.

At the first session of the school over 300 of the 5,000 employees reported for enrollment and the number has steadily increased with each meeting. All sessions are held in the new auditorium at the Chalmers factory, which seats 500 people.

Classes meet directly after working hours on Tuesdays and Fridays. Two sessions are held on these days at 3:15 and 5:30 p. m., to accommodate the employees whose work is completed at those hours. The company stands half the expense of supper in the factory dining room for every man enrolled in the classes.

Instructor Arthur, in the first few meetings, gave the workmen-students review work in mathematics, lessons in reading blue prints, and talks on general shop practice. As many employees in the manufacturing departments perform their daily work directly from blue prints, the lessons have borne fruit in the increased efficiency of the men.

Eventually the members of the class will be made thoroughly familiar with every step in the manufacture of a Chalmers car, so that they can be transferred advantageously from one department to another.

M. & A. M. Re-elects Officers

At the twelfth annual meeting of the Motor and Accessory Manufacturers, held at the Waldorf-Astoria, January 6, the following were reelected as members of the board of directors: F. Hallett Lovell, Jr.; C. E. Thompson, A. P. Sloan, Jr., and C. E. Whitney. W. M. Sweet continues as manager.

At the meeting of the board of directors held in the association's offices the following officers whose terms had expired were reelected to serve for an additional year. They are: President, F. Hallett Lovell, Jr., Lovell-McConnell Mfg. Co., Newark, N. J.; first vice-president, C. W. Stiger, Stromberg Motor Devices Co., Chicago, Ill.; second vice-president, C. E. Thompson, the Steel Products Co., Cleveland, O.; third vice-president, T. J. Wetzel, the Dyneto Electric Co., New York City; treasurer, L. M. Wainwright, Diamond Chain & Mfg. Co., Indianapolis, and A. P. Sloan, Jr., Hyatt Roller Bearing Co., Newark, N. J.

Road Builders Change Convention Date

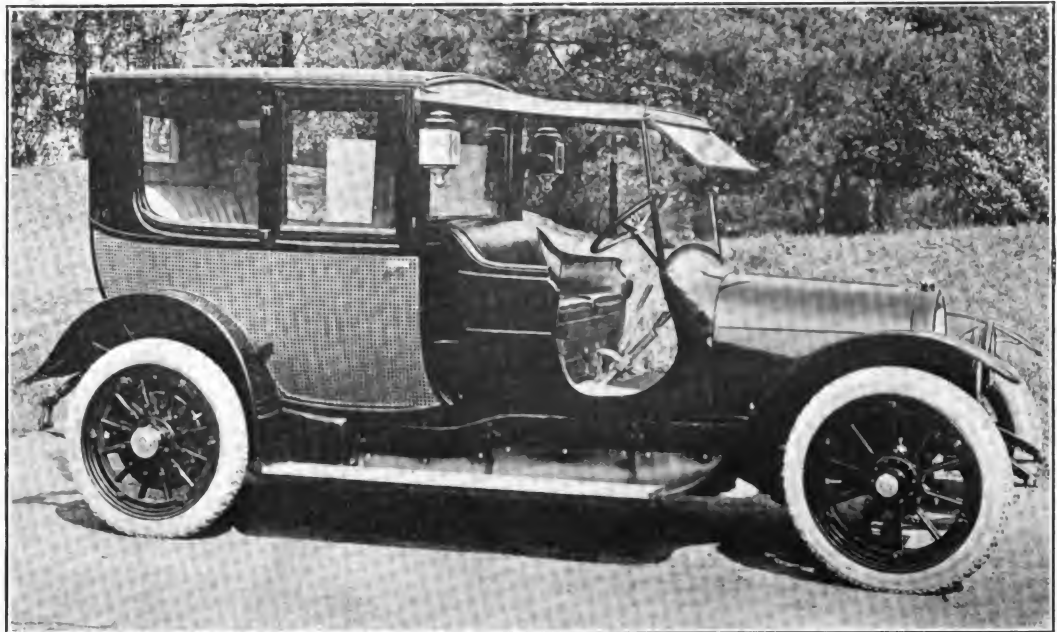
The American Road Builders' Association, which was to have held its thirteenth annual convention at Pittsburgh, Pa., during the week of February 22, has changed the date. It will now be held during the week of February 28, ending March 3. One of the reasons for making the change was to give more time for putting Mechanical Hall in a proper condition.

The "Brewster" Car

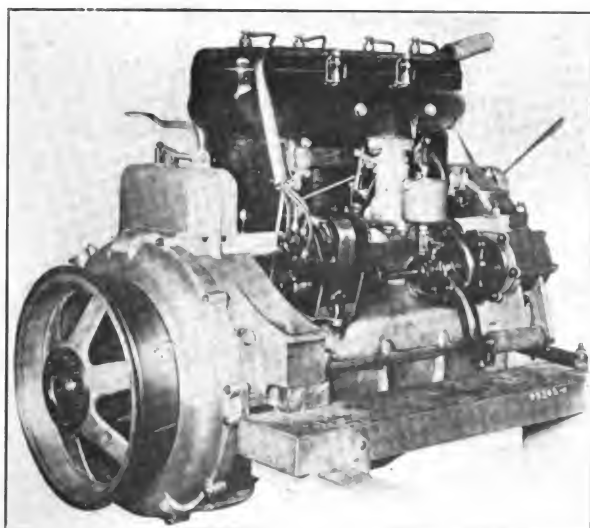
Anything emanating from the home of Brewster & Co. is bound to excite interest among vehicle builders. On another page we illustrate this company's latest product, built in its Long Island City plant and marketed in its New York City salesroom at 671 Fifth avenue. Concerning this car the company says:

After overhauling the leading makes, both foreign and domestic chassis, for the past ten years, we have at last decided to capitalize our experience, and now offer a complete car, built in our Long Island City factory. In making our decision we have specially considered simplicity and endeavored to produce a car that would cause a minimum amount of trouble and care. To that end we have adopted the Knight principle of motor and four cylinders. This combination in a medium size car we believe will give the best results, as it is the simplest. There are no valves to grind, and the engine is most silent and efficient.

Being coach builders we have designed a chassis from the standpoint of the finished product, so that we have a car that hangs low to the ground—the rear wheels set sufficiently back to allow full door entrance. The springs are of the cantilever type—finally an extremely efficient car for town and suburban use, without being high powered and heavy. If the chassis is not overweighted, it can be used for touring, and on account of the great saving in weight, it is a much less expensive car to keep in tires and gasoline.



BROUGHAM—BREWSTER CHASSIS



Power Plant

For those who are interested in the technical part, we give a brief outline of the specifications as follows:

The motor is a four-cylinder sleeve valve Knight type: bore 4 in., stroke $5\frac{1}{2}$ in. Three main bearings. Cylinders in one block casting including both inlet and exhaust manifolds. The outside finish is enamel, baked on at a high temperature. The appearance of the motor is extremely clean and simple and all parts easily accessible. The base of the motor can be quickly dropped for examination of the bearings.

The connecting rod bearings are constructed with liners between the two halves. The crank shaft is counterbalanced, and all parts are in perfect running balance. Lubrication is by force feed—the oil pressure being graduated proportional to the work required. This system insures absolute lubrication, and no smoking troubles.

A specially designed Zenith carburetor is used. The inlet manifold being water jacketed and part of the cylinder casting.

The gasoline tank is carried in the rear of the chassis, the fuel being fed to the carburetor by the Stewart Warner vacuum system, the apparatus of which is located on the motor side of the aluminum dash board. Provision is made in the gasoline tank for a reserve supply, in case of emergency.

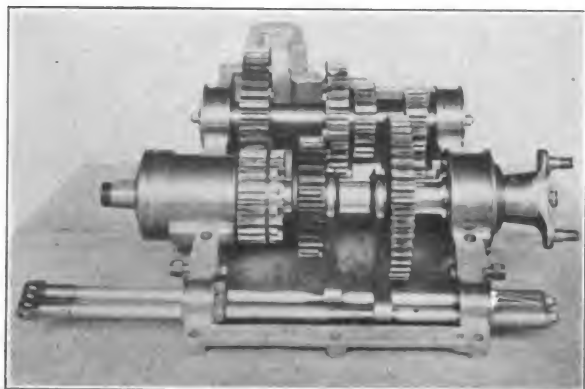
Ignition is by Bosch high tension waterproof magneto.

Starting and lighting is by electricity, the fuses of which are of easy access in the instrument board.

The clutch is of the leather cone type, with exceptionally wide face, and with specially designed engaging springs. The clutch shaft universals consist of two large size triple leather discs, the deflection of which allow for the disengaging of the clutch. These discs also make noiseless universals, which cannot work loose and rattle, and do not need oiling. These are the only universals in the drive.

The steering sector is of the worm and nut type. A special feature of the steering is the small radius in which the car can be turned. Timken roller bearings are used exclusively in all four wheels.

A selective type floating transmission is used, with three forward speeds and one reverse. By floating is meant that the transmission is a unit with the torque tube and rear axle assembly. This eliminates the necessity of any universal joints back of the transmission. No appreciable additional weight is added to the rear axle in this con-



Transmission Gear

struction, as the transmission is placed at the front end of the torque tube and directly back of a large ball and socket support.

The rear axle is full floating type, the outside housing being of drawn steel tubes. Helical bevel gears, the quietest type known are used. Both brakes are on the rear wheels, with eccentric brake drums and expanding shoes.

Cantilever type springs are used, all shackle bolts of ample size, hollow and provided with grease cups.

Wheel base, 125 in.; tires, 34 x 4½ in.; tread, 56 in.

Automobile Fatalities

Is the deadliness of the automobile increasing or decreasing? This question seems to be answered in a very conclusive manner by the Bureau of the Census, in making public some preliminary mortality statistics for the year 1914, which indicate that during the five years from 1909 to 1914 the number of automobiles in use in the United States increased more than twice as rapidly as the number of fatalities caused by them.

At the close of 1909, according to figures compiled by the National Automobile Chamber of Commerce, of New York City, from state registration reports, due allowance being made for duplicate registrations, the number of automobiles in use in the United States was approximately 200,000; by the close of 1913 it had risen to 1,270,000; and a year later, at the end of 1914, it was 1,750,000.

In the meantime the number of deaths due to automobile accidents and injuries increased from 632 in the death-registration area in 1909, containing 56 per cent. of the population of the United States, to 2,623 in the same area in 1914; and the increase from 1913 to 1914, for the registration area as constituted in 1913, then containing 65 per cent. of the population of the country, was from 2,488 to 2,795.

Thus a five-year increase of 775 per cent.—accepting as reliable the figures compiled by the National Automobile Chamber of Commerce—in number of machines has been accompanied by an increase of 315 per cent. in automobile fatalities; and a one-year increase of 38 per cent.

in number of machines has been accompanied by an increase of 12 per cent. in fatalities.

Perhaps a more reliable comparison, from the statistician's point of view, can be made between the increase in number of automobiles in use and the increase in the rate per 100,000 population for deaths caused by them. This is because, with a given number of machines in use in a given area, the fatalities due to them will tend to be proportional to the population of that area. When the comparison is made on this basis, it appears that a five-year increase of 775 per cent. in number of machines has been accompanied by an increase of 258 per cent.—from 1.2 to 4.3 per 100,000 population—in the death rate resulting from automobile fatalities. Similarly, a one-year increase of 38 per cent. in number of automobiles has taken place along with an increase of only 10 per cent.—from 3.9 to 4.3 per 100,000—in the death rate charged to them.

One cause of this proportional decrease in the destructiveness of the automobile is undoubtedly to be found in a reduction in average annual mileage per machine; but, after due weight is given this factor, and a suitable margin is allowed for possible error resulting from inaccuracy in the estimated portion of the automobile statistics, the figures still appear to furnish ample justification for the conclusion that the automobile today is being driven with more care and more regard for public safety than it was a few years ago.

Plating Aluminum with Nickel

An apparently successful method of plating aluminum with nickel was described in a recent number of the Bulletin de la Societe d'Encouragement pour l'Industrie Nationale, by J. Canac and E. Tassilly. The process permits the direct deposition of nickel on aluminum in an adherent form. The metal is cleaned by passing it through a bath of boiling potash and then scrubbed with milk of lime. After soaking in a bath of 0.2 per cent. potassium cyanide for several minutes, it is submitted to the action of an iron-hydrochloric acid bath, 500 parts, HCl, 500 parts H₂O and one part iron, until the metal takes on a certain appearance described as metallic "watering." It is washed with water after each of these operations.

The formula found satisfactory for nickel plating is: Water, 1,000 c.c.; nickel chloride, 50 grams; boric acid, 20 grams. The current is 1 amp. at 2½ volts. The plated metal is said to have a pleasing soft gray appearance, easily taking a metallic luster when polished with a wire brush, the plating being remarkably adherent. The plated metal is claimed to endure hammering and to be bent in sheet form without cracking. The metal, as cleaned in the iron-acid bath, shows under the microscope a surface full of minute cavities in which the nickel deposits and adheres.

American Wagon to Make Farm Truck Bodies

The American Wagon Co., of Dixon, Ill., will soon commence the manufacture of a convertible farm wagon body which also will be available for the chassis of a motor truck. Plans and specifications are now under discussion, and as soon as the models are produced which accord with the ideas of the company, production will commence upon an extensive scale.

Advantages of Light Weight Enumerated by Duryea

By Charles E. Duryea, Technical Expert

When the average man thinks of light weight with reference to his automobile, he, of course, considers only the total weight of the car and too often asks: "What matter about the weight? Does not the engine pull it?" Arguments as to efficiency and the various other gains have in days gone by been all too deep for him. He could appreciate only that which he saw and he could see a big car with its massive parts and imposing bearing. It impressed him with the idea of power and speed. So the massive construction won.

But right never dies. Merit is immortal and sooner or later will bob up after the fallacies have had time to explode and blow away. So light weight is rapidly coming into its own. The visitor to the National Automobile Show at the Grand Central Palace found more evidences of the growth of the light weight idea than ever before and in some of the most unexpected places. He saw exhibits of wonderful triumphs of mechanical designing and noted that they led toward lighter and still lighter weight.

That the modern automobile will closely follow the history of the horse-drawn carriages and the bicycle and eventually become lightened to a degree even now considered impossible has long been in the minds of many, but that this lightening would be pre-eminent at some of the places where it is now found was not foreseen. And the future undoubtedly holds still further surprises for us.

The first form of lightening the car came in the choice of better materials. The early structural steels, amply good and probably best for their purpose, were far from being the best materials for automobile construction. The still scarce metal aluminum was introduced for crank cases in 1895. It was tried for many other services in the next few years by different builders but not largely used because at that time suitable alloys and proper foundry handling could not be had. But better steels came, better shop practice became common, until the modern automobile is a marvel of strength and endurance. And so gradual has all this all been that we have not thought of the weight that would have been required had it been necessary to use enough of the older materials to obtain the modern strength.

Since the previous automobile show there has been another long step forward in the matter of light weight. The use of aluminum for pistons marks the success of experiments begun several years before the end of the last century. The light piston permits light connecting rods and light bearings. It permits high speeds and thus a reduction of engine weight. High speeds accompany small cylinders, which in turn mean many cylinders, with the result that the engine needs almost no flywheel and the strain on the transmission and driving shafts is both light and continuous instead of a series of heavy impulses that require heavy parts to resist.

So the use of aluminum pistons not only saves a small amount of weight in the pistons but it saves weight every inch of the way to the wheels. This saving permits lighter wheels, lighter frames and, of course, lighter springs and lighter tires to carry these lighter loads. It has been stated and it is doubtless well within the truth that a

pound saved at the flywheel of the engine permits five pounds to be saved in the weight of the car.

Of the money value of this weight saving much should be said. The light car burns less fuel and thus every day pays toward the cost of its lighter weight. But best of all it is more flexible and responsive and is more of a pleasure to drive. It starts and stops quicker and is therefore more safe. The light car is the car of the near future.

Aeroplane Exports Assume Large Proportions

The manufacture of aeroplanes in this country is assuming proportions indicating that the industry is fast becoming a highly important one. The following table of exports of aeroplanes, compiled from government statistics, is striking:

	Aero- planes	Total Value	Average Value
July, 1915.....	2	\$4,000	\$2,000
July, 1915.....	138	880,836	6,382
August, 1914.....	1	1,500	1,500
August, 1915.....	62	588,600	9,493
September, 1915.....	5	16,600	3,320
September, 1915.....	15	101,950	6,796
Nine months ended Sept. 30, 1913	16	48,900	3,056
Nine months ended Sept. 30, 1914	30	169,999	5,666
Nine months ended Sept. 30, 1915	349	2,423,805	6,945

The increase has been from about three per month to October 1, 1914, to nearly 39 per month at present. The advance in values is also striking, signifying an increase in size or in the cost of raw materials, or both. Each machine exported in September averaged in value \$6,796, as compared with less than \$3,000 a year ago. For the nine months to October 1, 1915, the average value of each aeroplane was \$6,945. The values in August, 1915, are higher than usual.

The consumption of high grade steels by this new expanding industry is not insignificant. Prior to the war steels necessary to aeroplane manufacturers were imported from Germany, but now the enterprise of some electric and crucible steel makers in this country has produced special grades which fully meet the unusual demands made upon them.

Some of the Things Entering in Motor Car Production

The American motor car industry last year made use of the following raw material: Steel, 670,000 tons; aluminum and alloys, 4,020 tons; brass, 2,141 tons; hair for upholstery, 1,068 tons; moss, 2,050 tons; hides, 67,232, on the basis of one-third hide per car where real leather was used; artificial leather, 3,280,000 square yards; upholstery fittings, \$917,542 worth; burlap, 6,560,000 yards; top material, 11,405,250 yards, valued at \$2,447,780; manufactured cotton in tires on new cars only, 7,950 tons; celluloid, 300,000 pounds; rubber and compounds, 9,338 tons; hinges, 2,446,780 pairs; door catch fittings, 2,446,780; carpet, 489,356 square yards; linoleum, 642,908 square yards; boards for floors, wheel and bodies, 8,450,000 running feet.

Harper Makes Trailer

The Harper Buggy Co., Columbia City, Ind., is manufacturing a trailer of 1,500 pounds capacity, arranged to be attached to a motor vehicle by means of a universal joint connection.

Heat Treating in Motor Car Manufacture

One of the most important but least understood processes connected with the manufacture of the modern motor car, is the science of heat treatment. It is an old axiom that "No motor car is stronger than its weakest point." The motor is the heart of the car and by that motor the manufacturer's reputation must stand or fall.

The heat treating department stands out as the manufacturer's chief insurance against weak, faulty parts in motor or chassis. In the Chalmers plant, according to C. C. Hinkley, chief engineer, every part that is subjected to severe strain must run the gauntlet of 30 furnaces in the heat treating department before it is ready for use. Among the parts treated in this department are steering arms, crankshafts, connecting rods, camshafts and gears.

The camshaft, which must undergo a great share of the motor strain, is first packed in a gas pipe about three inches in diameter. A carbonizing compound is then poured into the pipe and tamped lightly about the camshaft. After the camshaft is packed snugly away in its steel container the ends are securely plugged with fire clay and the camshaft is ready for the carbonizing furnace.

When the furnace has been stacked high with camshafts the doors are closed and the fire is turned on.

The heat generated in the carbonizing furnaces ranges from 1,650 to 1,700 deg. F. and is regulated from a central control presided over by a tender whose sole business it is to keep tab on the temperature and timing. Each job which goes into the fires is registered on a separate card which gives the tender a check on all work in process. Over each furnace is a combination light-indicator with three colored lenses—blue, green and red. When the blue light shows the temperature is too low and more heat is applied. When the red light shows it is a danger signal, indicating that the heat is too intense. The ideal temperature is indicated by the display of a green light. When all three lights are burning the job is done, and ready to come out of the furnace.

During the process of carbonization a change takes place in the texture of the steel. In direct ratio to the length of time spent in the furnace the carbon compound which surrounds the camshaft penetrates the surface of the steel. The part which is carbonized is called the case, and is much harder than the core, or interior which has not been reached by the carbon. To carbonize the steel through to the core would mean a weakening of the entire camshaft, because the steel would become brittle and lose its resiliency.

After the carbonizing process, the shaft is ready for its first heat treatment to toughen the core. It is again placed in a furnace, this time without its gas pipe protector. Again the fire is applied and the temperature raised to such a degree that the core is made tougher and more capable of standing severe strains. At the correct time, the red hot shafts are lifted from the fire and shot down an incline that gives them a whirling motion as they plunge into a vat of water. This rotary motion assures that all parts will reach the water at the same time, so that cooling will be even.

A third visit to the furnace follows for the second heat treatment for case hardening and closing the pores. After the final heating the shaft is again quenched in water.

The last step in the line of heat treating is a bath in boiling oil. This bath is administered to release any strains

or tension which the steel might have undergone in previous ordeals by fire. From the oil vats, the camshafts are taken to the sand-blast room. Here a surface scale, which has accumulated on the steel, is removed by means of sand driven through a hose under high pressure.

Not until the green camshaft has passed through all these operations is it ready for the lathe work and finer machining operations which render it suitable for installation in the car.

American Dyestuff Industry

American dye works are now turning out coal-tar colors at the rate of 15,000 tons annually. These colors are being manufactured wholly from American raw material. Before the war started we manufactured only 3,300 tons of coal-tar colors, made mostly from imported intermediates. The total imports of artificial colors before the war was something like 25,000 tons.

The manufacture of coal-tar crudes in this country has assumed large proportions, but owing to the great demand for such products in the manufacture of explosives, the dye works have not had the supplies they needed. Nevertheless there are now 17 firms engaged in manufacturing intermediates and 122 firms are turning out the finished dyes.

The textile and allied industries are united in the determination that the country shall not again be exposed to such a famine as it has recently experienced. The large organizations of dyestuff users have expressed a willingness to bear the burden of higher prices than prevailed before the war, if necessary. Most of the companies engaged in manufacturing coal-tar compounds are planning to continue their production along the lines already taken up and to enlarge such production or enter upon the manufacture of additional intermediates or finished dyes as circumstances warrant.

Big Producers of Cars in the Order of Their Output

Harry W. Ford, president of the Saxon Motor Co., Detroit, recently gave out a list of some of the biggest quantity producers, in the order of their volume of shipments for the nine months ending September 30, 1915. According to his list the first 15 cars are as follows:

Ford, Overland, Buick, Dodge, Maxwell, Studebaker, Cadillac, Reo, Saxon, Hudson, Chevrolet, Chalmers, Hupp, Paige and Oakland.

In point of dollars and cents volume, of course, there is a different relative position of the companies in the automobile business, as the makers of the higher priced cars do not have to ship the same number of cars to equal the same money value of shipments.

Can't Start Trucks on Ferries

The United States government is fining ferry companies about New York City \$500 for every time drivers of trucks or cars start their engines before the boats are fast to the docks. The ferry companies under the law can require that all gasoline be taken out of the tanks before the cars or trucks are taken aboard and they threaten to enforce this provision if drivers persist in running their engine on the boats.

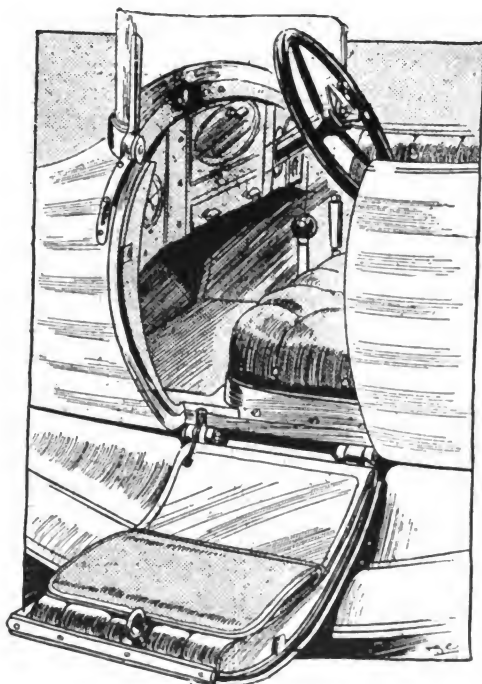
Clever British Body Design

A recent issue of the *Light Car*, of London, Eng., contains a description of an ingenious design of a streamline body for a light car which embodies many remarkable features. The car is the product of Hollick & Pratt, the well known Coventry coach builders.

This coachwork is fitted to a long wheelbase latest model 10 h.p. Calcott, and is for the personal use of Mr. Pratt. To obtain a true streamline effect it was necessary to depart from the standard radiator fitted to the Calcott cars, as the blunt outline of the standard radiator would have marred the final effect of the body.

It will be seen from the illustrations that a rounded radiator is provided, which not only harmonizes with the rest of the body, but has the further advantage of providing a considerably increased area to the oncoming air. The result is that this car is not only exceptionally fast, but also keeps extremely cool, even under prolonged full throttle work.

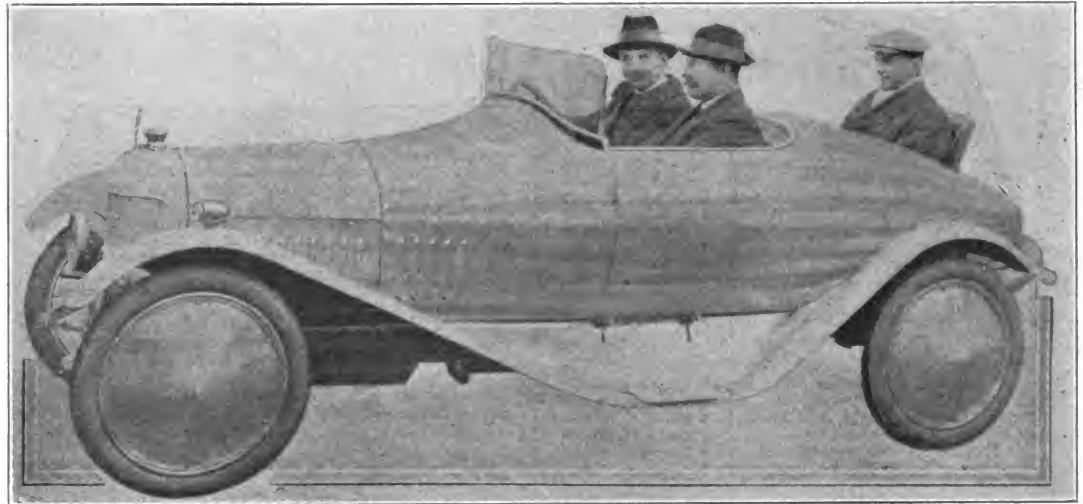
The panels are made throughout of aluminum, and the few joints, where these occur, are exceedingly well carried out; the final effect is that the whole body from bonnet to tail is one complete panel. The color is aluminum, but is relieved by broad stripes of a slightly darker shade. The upholstery is of red morocco, and the whole car presents quite the smartest possible appearance imaginable.



Extreme convexity of sides rendered conventional door impossible

No running boards proper are fitted, the wings being much flared.

Owing to the circular shape of the center of the amidships portion of the body, it was found impossible to fit a door on the usual standard type of hinge, and Mr. Pratt thereupon hit upon the ingenious plan of hinging the door at the bottom and letting it down so as to form a step by which the car may be entered. In order to obviate soiling the morocco upholstery on the inside of the door,



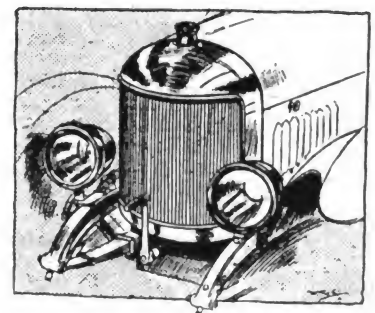
a flap is provided to fall down over the leather. On the flap is a little mat which is not spoiled by mud from the occupants' boots, and which can be brushed clean directly the mud dries. The whole idea is excessively neatly executed and exceedingly convenient.

Plenty of space for two adults is provided in the body, and very high sides and back give a great degree of comfort and protection.

The glass screen is beautifully made, and is curved so that the center is the highest point. In addition to this curving the glass is flared backwards at each extremity, and thus deflects the wind current well behind the passengers' heads and at the same time reduces air pressure from in front. Owing to the very high quality of plate glass from which the screen is made there is no distortion whatever of objects on the road to anyone looking through the screen.

The scuttle dash is very deep, and comes close up to the steering wheel, which has the advantage of bringing the driving screen close to the occupants and thus rendering it still more effective.

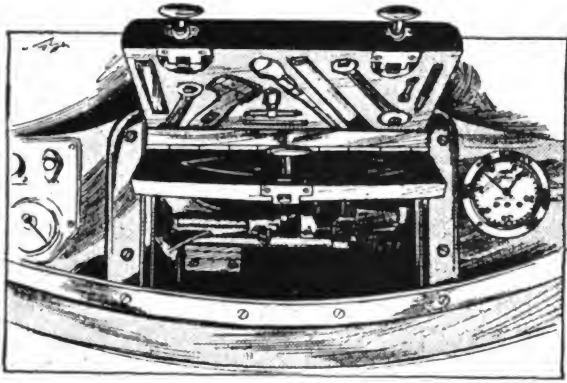
The space under the dashboard is well utilized. A gasoline tank holding no less than eight gallons is provided, and this is so arranged that there is always one gallon left in reserve after the main tank is emptied, thus giving the driver not only warning that his gasoline supply is failing, but also providing him with sufficient reserve to cover



Special radiator

about 35 miles. The total amount of gasoline carried is sufficient for a run of about 275 miles, so it may be taken that if one starts on a day's run with the tanks full one has nothing to worry about on the score of fuel supply during the remainder of the day.

In the scuttle dash is a cupboard and a drawer. As shown in one of the illustrations, these are put to excellent use, the upper compartments or cupboard being used to carry heavy tools, such as large tire pump, jack, tire levers, etc., and the lower drawer contains all the tools

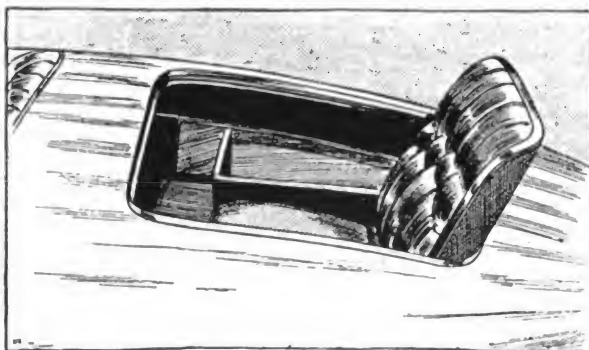


Cupboard and drawer in scuttle dash

likely to be required in any sort of roadside stop. Each implement is housed in a special space made to fit it, thus preventing all rattle and at the same time showing the driver at a glance if he has put back all the tools after a stop. A clock, speedometer, electric switchboard, and gasoline filler are all arranged on the dash.

The wheels are all furnished with aluminum discs, and are shod with 700 x 80 mm. Palmer Cord tires.

Behind the passengers the car resembles the deck of a small racing yacht, but a hatchway is provided, and on removing this there is exposed to view a cleverly arranged dickey seat. A great deal of space is provided around



Arrangement of the dickey seat

the dickey, and there is ample room for quite a tall occupant. When the dickey seat is in use the lid is carried on a special bracket inside the opening, and does not in any way inconvenience the occupant. Luggage, and quite a considerable number of parcels, can be carried in the tail of the car. At the extreme rear point a reflex light has been installed, but an electric tail lamp is also fitted to the rear dumb iron. Mamet shock absorbers are fitted at the rear, and the car sits on the road, even at the highest speeds, in a remarkably satisfactory manner. This is largely due to the long wheelbase (9 feet), and also to

the very careful and even distribution of weight along the chassis. Dynamo electric lighting is fitted, but no electrical starter. This, of course, would be easy to install, but the designer wished to save weight where possible.

Altogether this is one of the most striking and successful efforts of the coach builder to provide a true streamline body on a small chassis yet seen, and, needless to say, the car is the subject of considerable interest wherever it goes.

Automobile Exports Continue to Expand

Automobile exports continue at a large rate, as compared with conditions before the war. The following table, based on government data, shows the large expansion:

	Commercial Cars	Passenger Cars
July, 1914.....	50	1,265
July, 1915.....	2,469	4,118
August, 1914.....	66	385
August, 1915.....	1,614	3,839
September, 1914.....	128	646
September, 1915.....	2,227	4,299
Nine months ended Sept. 30, 1913.....	778	20,175
Nine months ended Sept. 30, 1914.....	637	19,530
Nine months ended Sept. 30, 1915.....	17,269	31,036
Year ended June 30, 1913.....	993	24,293
Year ended June 30, 1914.....	784	28,306
Year ended June 30, 1915.....	13,996	23,880

In 1913 exports of commercial cars were 1,009 and passenger cars 25,880. The very large expansion in commercial cars is striking, increasing as the months go by. It is an interesting fact that the average value of the exports in the first nine months of last year was \$2,760 for commercial cars and only \$865 for passenger cars, the total for the former to October 1, 1915, being \$47,769,216 and for the latter \$26,793,972.

Wagon Standardization

At a meeting of the Farm Wagon Department of the National Implement and Vehicle Association, held in Chicago, November 30 and December 1, the report of the committee on standardization was unanimously approved. This report, which was printed in full in *The Hub*, recommended certain sizes and types of wagons to meet the requirements of various sections of the country and the elimination of sizes and types not required. Some of the manufacturers have already adopted the recommendations of the committee and their current output conforms to the specifications in the report. Others expect to do so at once, and it is believed that the standardization plans will be in full effect by July 1, 1916.

The department also discussed the question of standardizing farm trucks and made plans by which this will be accomplished as soon as possible.

Demand for Vehicles in Turkey

The automobile is rapidly making inroads in Turkey. There are now scores of cars in Constantinople and other principal centers. Motor trucks will be much in demand after the war. In this trade the United States is more than likely to predominate, as American motor cars have at present an important place in this market. Turkey also affords a market for American wagons (farm wagons, delivery wagons, street sprinklers, etc.)

Oil-Burning Furnace for Heat Treatment of Automobile Springs

In order to secure the continuous and absolutely constant temperature required in the heat treatment of automobile springs, a Detroit firm has recently installed an oil-burning rotary furnace in its shops. The new furnace, designed and built by the plant engineer, is the only one of its kind in the world. It is comparable in shape to the head of a gigantic mushroom, being 26 feet in diameter and 81.7 feet in circumference.

Springs to be heat treated are placed on the revolving floor of the furnace, which makes a complete revolution in from 20 to 30 minutes. The rate of movement of the revolving floor may be regulated by altering the control of the variable speed motor which drives it. Jets of air and fuel oil placed at intervals around the outside circumferences are forced through vents left in the walls into the furnace at a great velocity. The oil is ignited through contact with the heated interior of the furnace, and maintains a constant temperature of from 1,450 to 1,575 deg. Fahr. Ten pyrometer couples register the temperature, and an electric signal board notifies the operator whenever the temperature either rises above or falls below the set limits.

In treating a large output of springs in the old type of furnace, it was necessary to heat the chamber to a considerably higher temperature than that required for the springs themselves. The steel springs were brought to the required temperature quickly and removed before they became too hot. The rotary furnace, in marked contrast, is heated only to the temperature required for the treatment. The steel attains this heat slowly, remaining in the furnace until it has reached the exact temperature desired. There is no opening and closing of doors to cause intermittent draughts and make the heat difficult to control, only one door being employed to load and unload the new furnace.

One crew of men operating the oil-burning furnace is kept busy removing the heated leaves as the revolving floor brings them into position, while another crew inserts others to take their place. The leaves to be treated are placed cold on the revolving floor and during the operation they gradually attain the maximum heat of the furnace. At the end of the revolution they are removed from the furnace and hardened in oil baths; the oil being kept at an even temperature through the agency of an air and water cooler circulating system which maintains a temperature of from 90 to 120 deg. Fahr.

After leaving the bath, the springs, which have previously been treated in the rotary furnace, are passed on to the "draw furnaces." Passing through these furnaces on an endless chain conveyor for 30 minutes, during which period they are subjected to a maximum temperature of about 100 deg. Fahr., the "temper" or hardness is modified to give the metal the necessary textile strength and ductility required by the severe conditions imposed on an automobile spring.

Aluminum in Norway

According to the Dutch Legation in Stockholm, an extensive aluminum smelter is being organized at Hoyan-fjord, Norway, where there is a waterfall which may furnish 60,000 horsepower. It is proposed to develop 20,000

horsepower at once, to provide for the production of 4,000 tons of aluminum per year. The capital stock of the company is fixed at \$3,350,000, of which \$2,680,000 is subscribed. The banks of Christiania and Bergen have declared a willingness to underwrite a loan of \$1,000,000 for the company.

A number of bauxite beds have been secured in southern France, where the ore will be worked into oxides and shipped in this concentrated form to Norway for the final conversion into metal by electrical furnaces.

Americans May Bid

Public improvements on a large scale are contemplated for Madrid. Under the Spanish law relative to protecting domestic labor and supplies, foreigners may not compete in the bidding on certain of these improvements, but the mayor has notified the American consulate that bids will be received for supplying the following:

New building for the municipal laboratory; cost to be about \$150,000.

Twenty-five automobile street sprinklers, equipped with sweepers.

Five automobile street sprinklers, equipped also with automatic collector of refuse.

Eighteen automobile street sprinklers with wide spray.

Twenty automobile dump carts for collection of street refuse.

Thirty automobile dump carts for removal of tin cans, etc., from private houses.

Three thousand metal refuse receivers for street use.

One hundred small hand-drawn or hand-pushed carts for street refuse.

The total cost of these vehicles is to be about \$500,000.

Construction and equipment of factory to extract ammonia, fertilizer, etc., from refuse collected; cost to be about \$200,000.

Automobile ambulances and sealed automobiles for transporting infected clothing, etc., to laboratory; cost to be about \$50,000.

More Space for Salisbury Wheels Will Increase Production

Additions totaling 30,000 square feet of space are to be made to the plant of the Salisbury Wheel & Mfg. Co., Jamestown, N. Y. With this additional space, the company expects to be able to produce 150 sets of automobile axles and wheels per day, an increase of 50 per cent. One of the additions will be an extra story to the brick dry kiln used for the felloes. This will be provided with an endless chain connecting the kiln with the factory. All the additions are to be completed by March.

In New Location

Louis Dusenbury & Co., Inc., importers and manufacturers of upholstering materials for automobiles and carriages, have moved from 222 Fourth avenue, New York City, to the Pocono Building, 229-233 Fourth avenue, just opposite their old location. While the old location was in a comparatively new building the new one is more modern and up-to-date and better suited to their purpose. Louis Dusenbury, the president, reports that business is extraordinarily good and that the prospects for the coming year are bright.

A Substitute for Pneumatic Tires

The solution of the problem of a substitute for pneumatic tires, according to a contributor in the Scientific American, appears to be furnished by a new material produced by an ingenious process in Paris. This product consists essentially of india rubber containing multitudinous minute bubbles of gas, distributed throughout its mass. The material resembles a rubber sponge in which the cavities are separate and do not communicate with each other. Hence it has received the name "caoutchouc mousse," or rubber foam.

The process of manufacture is based on the increase of solubility of gases with increase of pressure. Rubber in the pasty stage of vulcanization is enclosed in a steel tube with nitrogen at a pressure of 3,000 to 4,000 atmospheres. The compressed gas dissolves in the semi-liquid rubber, which, when the tube is opened, expands to four or five times its former volume and solidifies, imprisoning in its mass myriads of little gas bubbles, so that it resembles, in structures and properties, an assemblage of tiny rubber balloons.

The material, in fact, combines the properties of its two ingredients. It is as flexible as rubber and as compressible as a gas, so that it may be employed, in the form of a solid ring, in the place of the air tube of a motor car or cycle tire. A tire so constructed is non-collapsible, for a puncture affects only a few of the innumerable gas bubbles.

Another valuable property of rubber foam is its lightness. Its density varies from 0.4 to 0.17, according to the quantity of gas forced into it. Hence, it is an excellent material for life preservers and small folding life rafts. It is also a very suitable filling for cushions and chair seats, and especially for horse collars, as it is light, impuncturable, and does not scratch or gall the skin if the cover is broken. It is also used in shoe soles, tennis balls, etc.

Rubber foam possesses still another valuable property. It is the best heat insulator known, and about twice as efficient as its nearest competitor. It has already proved its excellence as a lining for ice boxes and refrigerating apparatus. Ordinary glass bottles, covered with a layer of rubber foam, keep liquids hot or cold.

The "Anderson-Six"

A southern motor car, built in South Carolina, is a reality. The "Anderson-Six" is the name of the car, The Anderson Motor Co., of Rock Hill, is the builder. J. G. Anderson is president of the company and it is owned and controlled by the stockholders of the Rock Hill Buggy Co.

The "Anderson-Six" will be on the market in the spring and will sell for \$1,250. A number of cars already have been completed and tested.

Joseph A. Anglada, consulting engineer, vice-president and member of the Council of Automobile Engineers, is the man primarily responsible for the "Anderson-Six" and its performances.

By way of evidence that it possesses an unusual abundance of good points as compared with cars at similar price, these points of distinction may be mentioned:

Divided front seats; seats for sixth passenger; swiveled searchlight attached to windshield; electric cigar lighter; "trouble" light; power tire pump; motor meter;

luggage straps on running board; foot warmer for winter use. Its engine is built by the Continental company and will have a speed of 50 miles an hour on good roads.

In upholstering, roominess and the other respects that contribute to comfort and pleasure, the designers and makers have no misgiving that it will successfully challenge competition and comparison. In taste and beauty of lines it will speak for itself in a manner that will satisfy the pride of the owner. In the designing and manufacturing of bodies the experience of the Rock Hill Buggy Co., which will be at the command of the motor company, guarantees for it a quality equal to that which any other company of established reputation could promise.

Both Buggy and Auto Business Grow

The Columbia Buggy Co., 21-23 Selden avenue, is one of the old companies in Detroit which have been revolutionized to meet the new conditions brought about by the growth of the automobile industry. Columbia wagons and vehicles have been in use throughout the United States for more than a century. Fifteen years ago, seeing the trend of the vehicle business in a new direction, the company took on as a side line the manufacture of commercial bodies for Ford cars. So fast has this branch developed that it has now become the principal business of the company.

Four years ago the company outgrew its old quarters at 51 Woodward avenue, and moved into the modern and fully equipped assembling plant on Selden avenue, where it is now located. Here it completely fills a five-story building with more than 43,000 feet of floor space.

It is an interesting sidelight that here in Detroit, notwithstanding that it is the center of the automobile industry, the Columbia Buggy Co. still maintains one of the largest wagon salesrooms in the United States. The company's new automobile body business has grown not at the expense of their vehicle business, but with it.

Technical School

Up to closing for the holidays the attendance at the Technical School for Carriage Draftsmen found every available desk occupied in the evening, but with room for a few more students in the day class. The average attendance was 88 per cent. in the evening and 100 per cent. in the day class.

The school reopened on January 3 with full attendance and every prospect for a successful term.

The Alumni Association held its twelfth annual dinner on January 7. It was a very happy reunion of men from seven states, Canada and New Zealand.

Batavia Rubber Has New Treasurer

New York capital will aid the Batavia Rubber Co., with factories at Batavia, N. Y., and sales and financial offices recently established in New York City, in extending and developing its business, Charles F. Marvin, formerly of Blake Bros. & Co., having become treasurer and a member of the board of directors, and George W. Hodges, of Remick, Hodges & Co., having also been added to the board of directors. Both will henceforth take an active interest in the company. They succeed O. C. Carpenter and Horace F. DeCamp. There is no other change in the personnel of the company.

Paint Shop

Touching Up the Auto

A well known automobile engineer has said that more cars are every day going to the scrap heap through destruction by rust and corrosion than from any other cause. The weakness and decay of metal through the action of rust and corrosion are becoming widely recognized.

To such an extent is the damage resulting from these agencies feared by railroads which within recent years have become large owners of steel passenger cars that special instructions have been issued to keep every fraction of metal well coated with metal specially adapted to steel protective purposes.

The automobile in regular use should be cleaned up and varnished at least twice a year.

The word varnish does not exactly convey the meaning of the labor involved. Before applying the varnish, says M. C. Hillick, in *Automobile*, the car will need to be cleaned up carefully, both body and chassis. Remove all grease and lightly rub the surface of the car body with pumice stone, flour and water. This practice gets away with any lingering traces of grease or foreign substances, and puts the film of old varnish in a receptive condition. Next, all defects in the finish, all blemishes of the color, and surface disfigurements in general, need to be touched over lightly and thoroughly with color matched to meet that upon the car.

This work calls for skillful brush use and good judgment. The match color under the most favorable conditions, and produced by a colorist of the best type, will fail possibly a trifle in being precisely the same shade as the old, for which reason the least used the better. In touching up, the painter may well be admonished to cover no surface beyond the actual defect. This touching up had best be done with a small lettering or striping pencil so that not only a very small quantity of color is used but that rough, coarse edges may be avoided.

Thick splotches of color cannot be successfully concealed under one or two coats of varnish, or for that matter, under any number of coats, so the essential thing to do is to apply the color sparingly and with a satiny smoothness. All this makes for the best possible sort of finish.

Frequently the finish is in comparatively good condition but with the color showing such a faded, disfigured condition that the only means of restoration consists in giving the entire surface a coat of color, running the ornamental lines over this, and then in due time applying the coat of finishing varnish. In many cases this process is practically as quick as the touching-up method, and scarcely more expensive. In the matter of appearance and finish it is in every way superior to the touch up and varnish practice, this latter feature being the one that, above all others, really commends itself to the car owner. There are many things connected with this touch up and varnish, or the one coat color and one coat varnish job, which the car owner should not let the painter forget.

The radiator, for example, should always get a fresh

smear of paint. A thin, tough coat of paint—one that under heat holds its luster. The fenders need to be finished with a hard drying finishing varnish. All defects, and parts which do not compare favorably with their surroundings, or with the finish in general, should be touched up with the proper color, or with varnish color, in a way to enhance the finish and balance the appearance of the car.

Not a few automobiles are being let out of the shop with the natural wood finish on the inside of the cars soiled and darkened to a condition detrimental to the appearance of the interior appointments. Wherever the finish is thus found the varnish should be taken off either with paste varnish remover or with steel scrapers, completing the operation by sandpapering with No. 1 sandpaper. Then apply a solution of oxalic acid which in the course of a few minutes will bleach the wood and restore its original color effects. Then rinse off with clean water and follow the evaporation of the moisture by a thorough sandpapering. Next proceed to fill the wood with a good mineral filler colored to meet surface requirements. Let the filler, after application, dry for 24 hours, and then apply two coats of orange gum shellac, sandpapering each coat carefully. A couple of coats of rubbing varnish, and one coat of finishing varnish, will then restore the natural wood finish to its proper sphere in the general finish of the car interior.

Some parts of the interior of the car, if not all, had best be given a rubbed and slightly polished finish. Door casings, door edges, stiles, and such other parts as are subject to considerable handling, will present a much finer appearance if so finished. All these parts are to be brought through with the necessary coats of rubbing varnish. The final coat should be a good grade of polishing varnish, freely applied.

In due time rub this coat with pulverized pumice stone and water, then with rotten stone and sweet or crude oil, after which go over the surface with the palm of the hand, rubbing smartly until under the friction so generated a moderate polish is developed.

In the event of a higher, brighter polish being desired, the surface after rubbing with oil and rotten stone may be polished by using a tuft of cotton or tow dipped in some approved make of varnish polish. The polish is a result of friction and this friction can best be developed by holding the tow or cotton in one shape until it becomes matted down and saturated with the polishing material to such an extent that in working it back and forth across the surface a sharp creaking sound is made.

A surface finished with this class of polish can be handled with impunity, and without leaving any visible signs of being "mussed up." For the closed cars in which it is desired to create an effect of real elegance coupled with creature comforts, with such effects to be maintained at their best at a minimum cost, the rubbed and polished finish offers advantages quite out of the ordinary.

More attention is being paid to the finish on the interior

of the car, and to all interior appointments, than ever before. The rubbed finish either in the popular dull effect, or in the full polish luster, furnishes a maximum of value at a minimum maintenance cost, and confers the luxury of the drawing room upon the interior of the car.

What has been stated with reference to the dull finish for the car finish applies also to the exterior. Everywhere the dull or "no-luster" finish is being exploited. This finish is being in many cases developed through the employment of enamel or flat drying paints. The best and most durable dull finish, however, is produced by bringing the exterior body surface up with the usual quota of varnish coats, and then rubbing the finishing coat to a dead, or an egg-shell gloss effect.

Sentiment in Paint, Oil and Varnish

The following address, which was delivered by John J. Sullivan, at the banquet in the Hotel Statler, Cleveland, O., of the National Paint, Oil and Varnish Association, is so beautiful in its sentiment that we feel sure it will be appreciated by our readers, says *The Painters' Magazine*:

The subject that I have chosen for this festal occasion seems hardly appropriate. It sounds dry and prosy. In the midst of this gay assemblage of stalwart men and handsome women, ensconced in the fragrance of sweetest flowers and regaled by the splendors and luxuries of this palatial banquet hall, the words "Paint, Oil and Varnish" sound like discordant notes or sweet bells jangling out of tune. But to the lover of poetry and sentiment the words do touch the heart and soul, and there rises before the vision and flashes before the mind the seven wonders of the world of color that have delighted, dazzled and dominated the universe since the Garden of Eden.

These words, even in their business sense, have a charm and inspiration. A newly painted object is an inspiration to the eye of man. It delineates the character of man. It proclaims to the world the prosperity of the individual. "Paint, Oil and Varnish" is the apparel that oft proclaims the man. It is like sunshine before the face of humanity. Its powers of transformation beautify the world and gladden the eye of everyone who beholds it. It is the fulfillment of the plans of Providence. The color scheme of nature is the Hamlet in the tragedy of human life.

The earth was without form and void and darkness was upon the face of the earth, and God said: "Let there be light, and there was light." Then the rainbow was born, and fruit, foliage and flower donned the garments of their rich and royal radiance. The world was void and without form no more forever. The Supreme Artist had given birth to royal color and painted on the face of nature the mother of all the masterpieces that ever sprang from the soul of golden genius.

Paint—the shining sun; oil—the soft and mellow moon; varnish—the shimmering stars of night. Thus the poetry and romance of nature itself is the soul and sinew of your universal calling. It is Rembrandt, Angelo, Turner and Corot. It is the golden gleam of midnight's gentle moon on the silent sea. It is the glory and grandeur of the silver sun piercing the clouds of heaven, riding in the black chariot of the raging storm to the wild music of heaven's artillery. It is the moonbeams on the sea, like a silver ribbon on the brow of Neptune's daughter; the ocean, with its deep blue and gentle green, and the downy pillow in the mountains of the clouds, framed in the sky of royal

blue. It is the virgin snow, the verdant sod, the virgin white of falling waters, singing praises to the Master Painter of all. It is the rainbow painted by Heaven's own hand and rung by angels in the sky of blue. It is the golden dawn of spring's sweet morn kissing the drowsy brow of the waking hills.

It is the sun and moon and stars, the gold and silver triune of the sky.

It is the rosy blush on the face of flowers, captured by doting mothers for the cheeks of babes.

It is the genius of the Divine Artist in every autumn leaf and the panorama of the angels in the foliage of the falling year.

"Paint, Oil and Varnish"! How typical of human nature! The moods and humors of a human being are like the colors of the seven-hued arch that spans the sky. Paint is the shining countenance; Oil, the countries, and Varnish the polish of man. Take away these elements and we have the tramp, no matter how royal the soul may be. The shining face is the serenity of the soul, the courtesies are the embellishments that qualify us for high places in the social fabric and polish is the personality that impresses society with our worth.

Thus while traveling the rocky road of human life we are inspired by the great scheme of wondrous colors that shed their royal radiance on all that there was, all that there is, and all that there shall be, and in life, as in nature, what we are and what we do depends upon how we mix the "Paint, Oil and Varnish" of human life.

Electric Furniture Rubber

The human furniture rubber may increase his labor output five times, it is claimed, by the use of an electric rubber which has been recently put on the market. Hand rubbing, which is generally resorted to at the present time in finishing all good furniture, is hard work and requires a rather high class of labor so that it enters very largely into the cost consideration of the article being made. The electrical rubber has but to be intelligently guided and it will perform the work in a manner sometimes superior to that of the hand worker. It is more rapid for the reason that it makes about 400 strokes per minute, which is much faster than it is possible to move the human hand. The rubber consists of a completely enclosed motor of one-fourth horsepower which is mounted on a substantial base and supplied with two handles by which its movement over the surface of the wood is controlled. A flexible cord connection carries the power from any convenient lighting socket, and mounted at a point near at hand is a switch for controlling the motor. The base of the device is oblong in shape and at each end are two felt pads which are rapidly oscillated when the motor is in operation. For rubbing, the pads are removed and covered with emery cloth or sandpaper of the desired quality and the surface of the wood is cut away as the device is passed over it. Because of its shape it may be worked right up into corners, and is said to be particularly efficient in working over large, flat surfaces.

To Sell Plant of Franklin Wheel Works

At a recent meeting of the stockholders it was voted to sell the plant of the Franklin (O.) Wheel Works.

Balancing the Advantages

As a logical result of the eight cylinder movement, the twin-six or twelve cylinder engine stands out as one of the most marked developments of the new season. The adoption of eight-cylinder motors by a large number of manufacturers for the coming season is also a surprise, not because the practicability of the V engine having that number of cylinders was questioned, but because the six-cylinder engine had been developed to a point where it was thought sufficient for all practical needs. It not only provides smooth running and even application of power with a ready acceleration, but it also provides a power plant that is practically vibrationless and that can be throttled down so a very low car speed may be obtained without shifting gears.

When first introduced it was thought that the eight-cylinder engine would be suited only for the larger cars, and that the added complication would make this type unsuitable for use in the moderate-priced cars purchased by people of modest means who act as their own chauffeurs. Even this belief was destined to be changed by the introduction of not only small eight cylinder motors, but also small twelve-cylinder power plants intended for cars selling around \$1,000.

It does not seem to the writer that there is a sufficiently marked advantage in the use of eight and twelve cylinder motors to warrant the added complication in cars intended for the masses. Repair costs cannot fail to increase in almost a direct ratio to the number of cylinders employed as relates to power plant maintenance. Expert repairmen have submitted figures showing this to be true. So the problem resolves itself into the balancing of the advantages and increased maintenance cost of the eight and twelve-cylinder cars against the simple four and six-cylinder types, and arriving at a decision in this controversial question.—Victor W. Page, in *Scientific American*.

Mandt Wagon Factory Passes 50-Year Mark

The Stoughton (Wis.) Wagon Co. was 50 years old the past year and it has made history in the manufacturing line. Targe Mandt, the viking, in build, voice and manner, was the founder. He started on a small scale in a blacksmith shop, where the department store now stands, with Mr. Getts, who later moved to Oregon, Dane county, as a partner.

But Mandt had ambitions and began to distribute his energies. Stoughton had a water power and he built a shop with an overhead connection to the dam. The Mandt wagon was his ideal for farm purposes and demand for it spread through the northwest. The wagons brought \$85 each and Mandt imported laborers from Norway, who worked for a dollar and a half a day till they learned better, to pay for their passage across. At the present time such procedure would have been punished by imprisonment, but Mandt was a pioneer and every one who came at his call was pleased at the opportunity. Many of those pioneers have owned farms, stores and banks and educated their progeny.

Mandtville, an addition, located in the south part of the city, was built up through the efforts of Mandt. Mandt was more or less of a ruler, kindly, generous, considerate, would run his shops at a loss to keep the men and enable them to have three square meals a day. He had been a

laborer himself and sympathized with his class. Mandt would buy ground, and contract with his men to give them homes, a few dollars a month and behold the city grew and prospered and through Mandt the city is now engaged in manufacturing on a much larger scale.

The fiftieth anniversary of the Stoughton Wagon Co. is the anniversary of Targe Mandt. Before Mandt, wagons were made by hand. The Stoughton Wagon Co. recently sent to its agents little folders reminding them that the company was 50 years old.

Leather Shortage in Germany

One of the effects of the shortage of leather in Germany is that substitutes are being largely used in the making of boots. Wood, canvas, and leather cloth are all pressed into service, and, in some cases, footwear of a quite original character is advertised under various fancy names. The canvas soles are said to be both flexible and serviceable. The boots and sandals are, of course, remarkably cheap, and may be largely worn by the poor if the war is continued throughout the winter. All the leather produced in Germany must, by government decree, be delivered to the military authorities and the quantity released for civilian wear which is unsuitable for the army or navy is said to be very small, while the prices are extraordinarily high. Laborers are especially hard hit, as leather for the heavy boots which they are accustomed to wear is almost unobtainable. The German Boot Manufacturers' Association has petitioned the authorities to release a certain quantity of sole and curried upper leather.

Issuing New Catalog

The August Schubert Wagon Co., Oneida, N. Y., has now in the hands of the printer a catalog which will shortly be ready for distribution illustrating many of the commercial bodies which it is ready to supply the trade. This company has had many years of successful experience in building wagon and motor bodies of a high grade and their reputation is excelled by none. The company is building bodies in large quantities but is confining its appeal to the class of trade which wishes a special body built according to the particular needs of each customer. "Quality Counts" is the slogan.

A little later this company will also issue a catalog illustrating light weight ambulance, funeral car, patrol jobs, etc., complete, chassis and body fully painted and equipped, ready to use. A choice of standard and high grade chassis will be given and the line promises to be very interesting to the trade.

Owensboro Wagon Changes

J. R. Miller, formerly traveling salesman for the Kentucky Wagon Mfg. Co. in Indiana and Ohio, will now cover the same territory for the Owensboro Wagon Co. R. I. Hollis, former traveling salesman for the Kentucky Wagon Mfg. Co. in North Carolina and South Carolina, is now in Kentucky territory for the Owensboro Wagon Co. C. A. Newson, formerly traveling for the Kentucky Wagon Mfg. Co. in Georgia and Florida, is now representing Owensboro interests in Tennessee territory. F. C. Hassen, of Cincinnati, O., will be traveling representative for the Owensboro Buggy Co. in Kentucky and Tennessee territory.

Bad Railroad Year

Fewer miles of railroad were built in the United States during 1915 than in any other year since 1864 and more miles of railroad were in receivers' hands during the year than ever before, according to railway statistics compiled from official sources by the Railway Age Gazette and made public. There have been only three other years since 1848 in which the increase in railway mileage was less than one thousand miles and those were the Civil War years of 1861, 1862 and 1864.

In 1915 the total miles of new road constructed in the United States were 933, as compared with 1532 in 1914 and 3071 in 1913. There was also a reduction in the second trackage built. The largest mileage of new road in one State was built in Pennsylvania, which constructed ninety-eight miles. Oregon was second with eighty-three miles and Washington third with seventy-one miles. Eleven States built no new road at all. Canadian roads built 718 miles of new first track as compared with 1978 in 1914, while in Mexico 36.5 miles were built as against none recorded for 1914.

According to the statistics quoted, receivers now hold and operate 38,661 miles of railroad with a total funded debt of \$1,607,895,500 and total capital stock of \$747,004,861. The roads in the hands of receivers represent nearly a sixth of the total mileage and capitalization of the railroads of the United States. On October 1 there were 41,000 miles of railroads in the hands of receivers, the greatest ever recorded. Since then the receivership of the Wabash, 2515 miles, has been terminated and several smaller roads have been sold under foreclosure. The mileage now under receivership was exceeded on June 30.

Roads having a total mileage of 20,143 and a capitalization of \$1,070,808,628 went into receivership during the calendar year 1915, the greatest mileage to go into bankruptcy since 1893.

Statistics on the number of new cars and locomotives ordered during 1915 show that there was an increase over 1914, but was smaller than any other year in recent times, except 1908. The freight cars ordered in 1915 totaled 107,796, as compared with 80,264 in 1914 and 146,732 in 1913. New passenger cars numbered 3092, as against 2002 in 1914 and 3179 in 1913. Locomotives ordered during these three years numbered 1573, 1265 and 3467, respectively. The bulk of orders last year was placed during the last three months and include 302 cars ordered by the Pullman company for its own use and 18,222 freight cars and 850 locomotives ordered by foreign countries.

The miles of railroad operated under block signal systems increased 9677 miles during 1915, to a total of 97,809, while the automatic signal mileage increased 1471 miles, to a total of 31,160.

Gathering of Old Timers

While the auto show was on there was a gathering in New York City of old timers familiar to the carriage and harness trade that reminded one of the palmy days of the Grand Union Hotel.

The gathering took place at the Hotel Ennis, at 152 E. Forty-second street, one block east of the Grand Central terminal, which, while not as large as the old "haunt," is more up-to-date and is presided over by A. C. ("Tony")

Ametrano, who for 25 years was cashier for the Grand Union, and the carriage boys as well.

Everybody knows "Tony" and his able assistants, Room Clerk Rogers and "Old Sleuth" Dan Carrigan, of the old Grand Union staff. Things have changed in the carriage trade and on Forty-second street, but these boys are just the same. Among the party comprising the old guard were: W. A. Garrison, J. W. De Lamater, H. H. Sickels, A. W. Hover, S. W. Lasher, Wm. Johnstone, C. B. Van Alstyne, J. L. Nelson, C. E. Wells, V. D. Ten Broeck, F. D. Reed, Chas. C. Hayes, W. P. Mallon, C. F. Oatway, John Rockefeller and E. A. McGrew.

Personals

Harry Wilk has resigned his position with a Chicago trade paper to become associated with Moller & Schumann Co., Brooklyn, N. Y., manufacturers of varnishes and enamels. He will act as assistant to Carl J. Schumann, sales and advertising manager of the company.

C. H. Rawlins has gone with The Gramm-Bernstein Co., Lima, O., manufacturers of motor trucks, as western sales manager. Mr. Rawlins' headquarters are at 736 Monadnock Building, Chicago.

George B. Ogan has been assigned the management of L. C. Chase & Co.'s plush, rubber, artificial leather and mackintosh goods departments, with headquarters at 326 West Madison street, Chicago, Ill. Mr. Ogan has been identified with the carriage trade for a number of years. In 1894 he entered the employ of the old Mansur & Tebbetts Implement Co., St. Louis, as office boy and worked his way up to manufacturing manager and buyer. He resigned January 1, 1902, to engage as a manufacturers' agent, representing accessory manufacturers. For the past several years the Chase line has demanded practically all of his time. Mr. Ogan was secretary-treasurer of the Implement, Vehicle and Hardware Association of St. Louis and it was with the deepest regret that they accepted his resignation.

A. E. Schafer, who for the past two years has been associated with the Flint (Mich.) Varnish & Color Works, as vice-president and general sales manager, has severed his connection with that company.

C. L. Hoff, general manager of the Standard Chain Co., York, Pa., has been elected president of the Pullman Motor Car Co., to succeed John C. Schmidt, for the past four months the head of the Pullman company. The duties of former President Schmidt, who is also president of the Standard Chain Co., having become too strenuous, is given as the cause for the change.

Kelly-Springfield Tire May Move to Springfield

The Kelly-Springfield Tire Co. may move its Akron plant to a new one in Springfield, O., according to plans of the company. Though up to the present time no suitable location has been obtained in that city the officials of the concern have been negotiating for the purchase of land there, upon which to erect new factory buildings.

Sulphur Content of Carbon Steels May Be Raised

That the sulphur content of basic open-hearth steels has been given a fictitious importance is the opinion of so great an authority as the author of this paper. It is Dr. Unger's contention that if sulphur is held down to 0.1 per cent. that is low enough for all purposes for which basic open-hearth steel is commonly employed. To test his theory Dr. Unger had a series of steels prepared, containing various amounts of sulphur from 0.025 up to well over 0.2 per cent. These steels were manufactured in the ordinary way and from them many sorts of articles were made by ordinary processes, the idea being to not only test the strength of the steel as first made, but to test it after it was in the finished form. All sorts of things from sheet steel stove pipes to automobile crankshafts were made and in a fairly lengthy paper presented at the annual meeting of the S. A. E., January 6, Dr. Unger tells what happened to the various steels in manufacture of the sample parts and in the testing machine afterward.

The results go to prove that the results are not noticeably improved in any way by cutting down the sulphur below 0.1 per cent. Below is the introduction to the paper which explains Dr. Unger's ideas, which was followed by an account of the detail adopted in making the steels and finally, a series of tests are quoted with their results. Of these, one table, characteristic of the whole, is given below.

During the last 15 years the proportional tonnages of steel manufactured by the Bessemer and open-hearth processes have undergone a great change. During 1900 about 65 per cent. of the total tonnage of steel made was Bessemer and 34 per cent. open-hearth. In 1914 about 26 per cent. was Bessemer and 73 per cent. open-hearth. Of the latter 94 per cent. was made by the basic process.

As the low phosphorus ores became scarcer, higher phosphorus ores supplanted them. The latter produced a pig iron too high in phosphorus to be used in the acid Bessemer process; consequently the basic open-hearth process, with its attendant purification, grew rapidly.

Wherever Bessemer steel has been used, the sulphur content has varied from 0.050 to 0.080 per cent. or even higher, depending on whether the iron was used direct from the blast furnace or remelted in a cupola. Millions of tons of Bessemer steel, containing an average of 0.070 sulphur, have been used for almost every purpose. The greater part of such steel is still in service, giving an excellent account of itself, and furnishing us with the best possible evidence that steel may contain a reasonable amount of sulphur without being injured in quality.

With the advent of basic open hearth steel the consumer found that from 0.040 to 0.050 per cent. sulphur, or about two-thirds that of the Bessemer, was the usual sulphur content of such steel. Believing that high sulphur always indicated that the steel was bad, he naturally insisted on the lower limit, or below 0.040 per cent. sulphur in his steel.

Sulphur in steel, whether justly or unjustly, is in many cases held responsible for the bad working of steel. As a result the specifications covering the allowable amount of this element have been gradually lowered until in certain cases below 0.030 per cent. is the limit demanded. It is very difficult to reach this limit by the basic open-hearth process, and when reached there is a grave doubt in the

minds of many whether the quality of the steel has not suffered by the excessive purification required to produce such results.

It became almost the universal practice when steel showed a tendency to work badly or become red short to make an analysis of the steel. If this analysis indicated that the steel had the proper or permissible amounts of the usual elements but happened to be a few thousandths of a per cent. higher than the permissible amount of sulphur, the sulphur was held responsible for the trouble. Such decisions are made without considering other causes occurring in the manufacture of the steel; such as the heating and rolling and subsequent operations in working it up into a finished product.

The manufacture of steel in quantities of several tons at one time began when the Bessemer process was introduced about 50 years ago. Chemical analyses at that time were crude, or not made at all. Failures due to poor raw material or improper metallurgical treatment were common. Sulphur was largely blamed for such results, and a strong prejudice against it was established. This belief has been handed down from one person to another. Rarely has it been questioned, nor have many efforts been made to establish the truth, until at the present time few are ready to believe that sulphur up to a reasonable amount, say under 0.100 per cent., does not affect or at the most only slightly influences the working properties during manufacture, or the quality of the finished steel.

Some steel making processes have been brought forward which produce a steel lower in sulphur than the basic open-hearth process, but where the author has had an opportunity to compare such steel with open-hearth steel having the same physical properties, no difference could be detected in the surface produced or the hot working properties.

Carbon Content	Sulphur Content	Elastic Limit, Lb. Per Sq. In.	Tensile Strength Lb. Per Sq. In.	Elongation in 2 In. Per Cent.	Reduction of Area, Per Cent.
.32*	.032	48,650	80,250	30.5	70.1
.32*	.068	48,550	75,550	32.8	68.8
.32*	.108	46,400	75,800	30.2	68.7
.32*	.146	46,700	73,350	31.5	67.3
.32*	.190	45,450	71,550	33.2	66.3
.32*	.230	45,850	70,100	31.5	65.0
.51†	.025	70,400	111,900	20.3	56.8
.51†	.055	76,300	120,800	19.7	51.3
.51†	.095	73,950	119,400	19.5	51.5
.51†	.135	76,800	120,600	18.3	49.2
.51†	.167	73,200	111,750	17.5	45.4
.51†	.230	66,350	106,550	20.5	44.7

*Heated to 830 deg. C., held for 20 minutes, quenched in water drawn at 600 deg. C., for 30 minutes.

†Heated to 816 deg. C., held for 20 minutes, quenched in water drawn at 565 deg. C., for 30 minutes.

The subject of sulphur in steel has been studied by others. Results have been published in which soft steel and wrought iron containing 0.300 to 0.600 per cent. sulphur have been successfully forged. The details are lacking, but it is my belief that such material would stand very little heating to a high temperature for forging without cracking or crumbling during the forging operation. I have in mind an investigator who has recently studied the effect of sulphur in different heat treatments of steel, with sulphur ranging from 0.032 to 0.157 per cent. Another studied its effect in rivet steel, containing from 0.042 to 0.105 per cent. sulphur; a third in drop forgings containing from 0.028 to 0.190 per cent. sulphur. Their results agree in this point: When other conditions are equal, no marked differences were observed in the working properties or in the quality of the finished material.

Rise in Tire Prices

Republic tire prices went up 5 to 10 per cent. following the general rise which was started January 17 when the United States Tire Co. advanced its prices 10 per cent. on all grades of its tires. On January 18, Goodrich, Goodyear, and Firestone announced increases. Goodrich tires are now selling 10 per cent. higher on the usual sizes of both cord and fabric types, no changes as yet having been made on the unusual or less popular sizes. Goodyear also increased its prices 10 per cent. on both its cord and fabric types; and Firestone announces a 10 per cent. increase. Goodrich has raised its prices on the 28 x 3 in. tires from \$8.50 to \$9.35; on the 34 x 4 from \$19.40 to \$21.34; and on the 36 x 4, from \$20.50 to \$22.55. The Goodyear 32 x 3½ in. size is now selling at \$14.70 as against the former price of \$13.35; the 34 x 4 is now \$21.35, compared with \$19.40; and the 36 x 4½ quotes at \$30.10, compared with \$27.35.

A number of the tire companies have not as yet announced any changes but expect to. The Hardman company expects to go up 10 to 20 per cent. in the near future and is at present taking few orders at the prevailing prices. The Ajax company expects to raise its prices at once, and Diamond tire prices, it is stated, are slated to go up.

These rises now include ten since January 6, when Kelly-Springfield started the increase with a 7½ to 26 per cent. jump. Empire list prices went up 15 per cent.; Falls rose 10 per cent., and Globe and Pennsylvania went up approximately 25 and 20 per cent. each.

Some of the new prices on United States Tire, Goodyear and Goodrich are as follows:

Goodrich Tires

Size	Old	New
28 x 3.....	\$8.50	\$9.35
34 x 4.....	19.40	21.34
36 x 4.....	20.50	22.55

U. S. Tires

Size	Old	New
32 x 3½.....	\$13.35	\$14.70
34 x 4.....	19.40	21.35
36 x 4½.....	27.35	30.10

Motor Truck Club to Expand

Plans to enlarge the scope, strengthen the financial position and adopt a more aggressive policy were made by the Motor Truck Club of America at its annual meeting, which was held December 15 in New York City.

Efforts will be made to secure a direct and close relationship between all the members of the club; opportunity will be given all members for active service through appointment on various special committees; division of the club work into special departments with committees to carry out the club plans in various lines; opportunity for the members to express their opinion as to the direction in which club activities should be guided, are some of the activities and policies planned.

A members' council will be formed which will be representative of the various business interests of the members. The council will serve as a guide to the club executives and will initiate subjects for investigation and agitation. Action was taken at the meeting protesting on the proposed federal tax on gasoline.

Ellis L. Howland, who was formerly secretary of the

club, was reelected to the position after a year's absence from its roll of officers—as a testimonial to the effective work which he had done for it. Others officers elected were: President, T. D. Pratt; vice-president, Roderick Stephens; second vice-president, David C. Fenner; third vice-president, Haywood P. Cavalry; treasurer, Nathaniel Mallouf; directors, George H. Pride, Joseph K. Orr, Emanuel Lascaris, Elmer B. Clark and A. J. Slade.

Overland Capital Now \$75,000,000

At a special meeting of the stockholders of the Willys-Overland Co., Toledo O., January 14, the proposed program to increase the capital stock of the company as previously outlined has been authorized. The new capital amounts to \$75,000,000, and consists of \$50,000,000 common and \$25,000,000 preferred. The common stock has been increased from \$25,000,000 and the preferred is a new stock issue.

This action formally approves the proposal outlined last November for the capital increase and also the issue of \$15,000,000 new convertible 7 per cent. preferred stock, which has been offered to common stock to the extent of 71½ per cent. of holdings at 110 and to the holders of the old preferred stock on similar terms. The old issue of preferred has been called for redemption at 110. The company has outstanding at present \$21,000,000 common stock.

Kentucky Wagon Salesmen Meet

The entire selling force of the Kentucky Wagon Mfg. Co. was called to Louisville to attend the year-end convention of the salesmen of that concern, the first meeting of which was held the morning of December 27 at 9:30 o'clock at the Hotel Henry Watterson.

Following the opening session, which was in the nature of a get-together meeting, the men visited the factory in the afternoon, remaining there from 1:30 until 6 o'clock, where discussions with the officials in regard to selling plans for the coming year's campaign were the rule.

An extensive program had been arranged, calling for two meetings daily. The meetings at the hotel were primarily the means of enabling the men to trade selling plans and ideas by the experiences of others, while the trips to the factory allowed the salesmen to see demonstrations of wagons, farm implements and other lines manufactured by the Kentucky Wagon Works.

One Coat of Paint Better Than Four

Experiments conducted for the Royal Society of Arts in England have shown that each fresh coat of paint put on top of another on an iron plate increases the amount of rust which forms on the plate. Four plates painted with one, two, three and four coats were exposed to steam for one day, the paint was dissolved off and the results mentioned were observed. The explanation given is that each subsequent coat tends to dissolve a part of the previous one and renders it more porous. Air and moisture penetrate to the iron by way of the pores.

The Studebaker Corporation has planned a production schedule for 1916 which calls for 100,000 cars. The factory has been running full capacity, and more than 5,000 of the new models have been shipped since January 1.

Western Retailers' Meeting

With the declaration, heard everywhere, that it was the best, largest and most profitable meeting of that organization ever held, the twenty-seventh annual convention of the Western Retail Implement, Vehicle and Hardware Dealers' Association came to an official end June 13, shortly before noon at the Century theatre, Kansas City, Mo. Previous to adjournment these new officers for the year were elected:

T. N. Witten, Trenton, Mo., president; E. C. Waldo, Ellis, Kas., vice-president; Herbert J. Hodge, Abilene, Kas., secretary; W. A. Carrington, Wellington, Kas., Charles Kennison, Kansas City, and A. A. Doerr, Larned, Kas., new members on the board of directors.

Mr. Witten's election came as a matter of course, as it is customary to elevate the vice-president to that office. H. J. Hodge was re-elected secretary of the association for the twenty-seventh consecutive year.

How the implement dealer best can handle the increasing tractor trade, one that promises to run a close race with the automobile in production in a few years, was the principal subject discussed at the closing session. Many were the experiences related in the tractor trade, some dealers asserting that their sales had been made quickly and that they had been put to no trouble or expense with the machines since they left their possession. Others had not been so fortunate, and said that all the profit they had expected to derive from the sale of the tractors had gone in maintaining repairs for them.

The general expression, however, was that the possibilities of the tractor business practically are unlimited and that the dealer who goes into the game now and stays in it will reap great financial profit. That the tractors are far from perfect at present and will be constantly improved for several years to come should not defer the dealer from entering the trade, it was set forth. The manufacturers, it was declared, should work with the dealer in keeping the machines in the best of order and rendering the service to the farmer to which he is entitled.

"Possibilities and Pitfalls in the Automobile Business for the Implement Dealer" was the subject of an address at the last session by C. O. Hitchcock, of Hutchinson, Kas. "Unless some member of the firm can devote his entire attention to the automobile trade, I advise that firm to keep out of the business," said Mr. Hitchcock. "The inclination of the clerks is to drop other business and rush to make an automobile sale if there appears to be a possibility. They would rather sell autos than anything else. I find that too much of their time is taken up in this manner. All the automobiles I sell are for cash. I pay cash for them and do not put any out on time."

"Commissions as at present regulated for the sale of farm tractors are entirely inadequate," declared A. A. Doerr, who delivered an address on "The Farm Tractor—Are Commissions Adequate?" "I do not accept tractors for sale on that basis. Buying for cash, I sell the machines on any terms I choose; taking the farmers' notes and charging interest on deferred payments. This I have found satisfactory in every way. I predict that the plan of the federal reserve banks in taking farmers' notes and advancing credit for them will do more than anything else to increase the sale of farm tractors. The tractor trade belongs to the retailers in view of the fact that they are

expected to render a service in the way of demonstrating and operating them, and assisting the farmers in getting the maximum of efficiency out of the machine. We keep two automobiles constantly employed in sending experts out among the farmers to keep the tractors running, and we consider this money well spent."

An interesting feature of the closing session was a call by the chairman to the women present to arise if any were actual owners or managers of implement houses. Four women arose. A discussion of questions in the "question box," a report of the freight audit bureau, and reports of the condition of the association completed the final session.

At the opening session Secretary McCullough of the National Implement and Vehicle Association greeted the convention on behalf of the manufacturers. Mr. McCullough later outlined the manufacturers' standpoint in regard to the proposed new terms of sale to be inaugurated in the near future. He declared that they were ready and anxious to join with the dealers in putting the implement trade on a more business-like basis and eliminate the old-time, long-term plan of sale. He advised the dealers to get their affairs in shape to be ready to finance the new plan when it is put in force.

In the annual address of President Collins he declared that the dealers represented in the association were in better shape financially than ever before; that the prospects for continued prosperity were never better, his address being optimistic in the extreme.

One of the most unique features of the session was a "playlet" presented by Vice-president T. N. Witten and 12 dealers representing a "talk-over" meeting between a dealer and his clerks. All the problems that come up in the course of ordinary business were brought up in this playlet and the discussion proved to be of great interest to the dealers at the meeting. How to meet customers, how to interest them, how to make sales and to become better salesmen were points of discussion by the "actors."

"In the 27 years of this association," said Secretary Hodge, "this is the best and biggest convention. There is prosperity in the air; the dealers are buying heavily in almost all lines. Many new members have joined today. We now have more than 1,700 in the association, which was started at Junction City, Kas., in 1889 with 18. The association has accomplished much for the retail trade or it would not have grown in this manner."

For being present at the convention with the largest per cent. of membership, Local Club No. 55, made up of dealers from Barber county, Kansas, and Wood and Alfalfa counties, Okla., were awarded the first prize banner this year. There are more than 40 local clubs in the association.

New York Registrations Increased

Predictions of automobile registration of 275,000 for New York state in 1916 are based on the rush for licenses during the first 14 days. In the metropolitan district 31,400 automobile have been licensed so far, as against 22,000 for the same period last year. Chauffeurs licensed number 11,125, against 12,000 in the first two weeks of 1915. Licenses issued to chauffeurs and automobiles so far this year have brought a revenue to the state of \$285,000. Last year's revenue for the corresponding period was \$202,000. For all of last year in the district 110,000 automobiles and 55,000 chauffeurs were licensed.

England Buys More Motor Trucks

By A. Jackson Marshall, Secretary, Electric Vehicle Association of America.

Because more and more men are enlisting for military service every day in England, women are filling many vacancies and performing many tasks which two years ago would have been considered entirely out of range of feminine possibilities. One of the striking examples of the versatility of the capable Englishwoman is her present employment as truck driver. Practically all of the trucks used for commercial purposes in England are now being driven by women. For this reason many English truck buyers are purchasing vehicles of but two or three ton capacity and less and there is a great demand for electric trucks because of their simple mechanism and ease of operation. While women are proving themselves efficient and careful drivers, the constant changing of gears, and the necessity of cranking by physical force, make the operation of heavy gasoline trucks a severe tax on their strength. The electric vehicle is therefore being employed to a large extent in capacities formerly devoted to the gasoline car. In a recent letter addressed to the Electric Vehicle Association of America, the English engineering firm of Heenan and Froude, Ltd., state that the number of electric vehicles in use and on order in that country are steadily increasing. The letter reads:

"The number of electric trucks is now 660, as compared with 150 a year ago. This does not appear very much at first sight. Under the circumstances, however, it is distinctly encouraging."

Messrs. Harrods, Ltd., a large department store of London, have recently received a shipment of 18 one-half ton electric delivery wagons, making a total of 73 electric vehicles now operated by this company. Other large installations are being made, and in many cases where gasoline cars were commandeered during the early weeks of the war, they have been entirely replaced by electric vehicle equipment. While the export of gasoline cars from this country greatly exceeds that of electrics, it is a significant fact that the majority of gasoline cars are sent to the war zone where they have an average life of only a few months, while the electric equipment being used only for commercial purposes becomes a permanent installation.

Government Constructs Armored Car

There is being finished at the government arsenal in Rock Island, Ill., an armored car for the United States war department, which is the first of the kind to be constructed in this country. Originally, the car was a Jeffery commercial truck. A 45 h.p. engine has been substituted for the 30, first installed, and when the car is ready for service a test will be made upon the arsenal drives. The entire machine, with the exception of the wheels, is protected with 2/10 in. armor, though armor plate will be substituted later. There are loop holes for the use of field glasses and two revolving turrets, on each of which is mounted a rapid-fire gun, each discharging 450 shots per minute, though this can be increased to 600 if necessary. The car will carry six men. Driving apparatus, which permits the car to go ahead or backward, is in position but is operated separately, thus requiring one man for each, the other four men to handle the rapid fire guns.

Work has also been started on a lighter and speedier armored automobile, which will be armed with one machine gun and carry a crew of two or three men.

Experiments have demonstrated that armor plate 2/10 in. thick will resist small-arms fire. This is as thick as the shields used on the machine guns in use in the European war.

The War Department also is planning a motor vehicle equipped with small rapid-fire guns, but limitation as to weight materially restricts the amount of armament that can be placed on such a vehicle. On account of the character of the roads here it will be impossible to use as heavy armored trucks in this country as in Europe, the limit of safe weight having been found here to be 8,500 lbs. England has purchased in this country supply trucks that weigh loaded between 12,000 and 13,000 lbs. Trucks as heavy as this would wreck many of our country bridges.

The Late James O'Connor

James O'Connor, manufacturer of vehicle name-plates, Cincinnati, O., died of apoplexy at his home in Newport, Ky., on November 10. Mr. O'Connor was a die sinker and general engraver and manufactured brass and steel stamps for shoe manufacturers, as well as name-plates for vehicles. He was born in Cincinnati, August 16, 1850, and was in business in that city for 30 years. He was a prominent figure in both the Order of Elks and Knights of Pythias. He leaves a widow, two sons and a daughter. It is reported that Mrs. O'Connor will continue the business established by her late husband and carried on by him for the last 30 years.

Eberly & Orris Discharged from Receivership

The Eberly & Orris Mfg. Co., Mechanicsburg, Pa., announce that the Court of Common Pleas of Cumberland county has discharged the concern from its receivership, and of the reorganization of The Eberly & Orris Mfg. Co., with the following officers: D. W. Sunday, president; J. C. Lambert, vice-president and general manager; A. L. Brubaker, treasurer; S. T. Sunday, secretary.

Premier Cushion Spring Co. Formed

The Premier Cushion Spring Co. has been incorporated at Detroit, Mich., its capital stock being \$25,000. The incorporators and officers are William D. McCullough, president; William A. Falls, vice-president, and Joseph A. Schulte, secretary-treasurer. The first two members were formerly with the Detroit Wire Spring Co. and Mr. Schulte is manager of the local Cadillac branch.

Michigan Hearse & Motor Co. Reorganized

The Michigan Hearse & Motor Co. has been reorganized at Grand Rapids, Mich. Walter Ioor has been elected president, succeeding Alvah W. Brown. Mark Norris is vice-president; A. C. Chapman is secretary and sales manager, and E. W. Aumeal, general manager. The factory has been enlarged through a three-story addition, 40 x 100 feet.

The capital stock of the Durant-Dort Carriage Co., Flint, Mich., has been reduced from \$2,000,000 to \$1,000,000.

A Notable Trade School

The Wentworth Institute of Boston opened its fifth year in useful and valued history last fall. It is a trade school for boys and there are 30 of them from various portions of the New England states receiving instructions in the Institute. The object of the Institute is to teach boys to be strictly first class workmen at the trade.

A complete course in forging, hardening and tempering embraces the curriculum. Heretofore, forging was taught in connection with the machine shop, but the demand for greater knowledge along this line was so great as to cause the directors to open up a forging department of an exclusive kind. The course is completed in one year and embodies such subjects as bending, upsetting, welding, drawing and general shop practice, tools and ornamental work in iron, likewise in the making of parts for machinery, being among the most prominent lessons conveyed to students.

When a boy enters the school, he is first given technical training, later he is put to the practical work in the shop, which is completely equipped for the doing of such work which is necessary to thoroughly and properly instruct each boy. Individual instruction is given during the course and one of the strong points embodied in this is in conveying to the students that it is not always brawn and might that makes the best workmen, but rather that they use their brains. When a boy leaves the school he is directed toward accepting a place as a helper in a regular shop, where he finds special opportunities for further advancement and with the knowledge obtained in the Institute he is soon able to pronounce himself a complete master of all work which he undertakes to do.

Instructors in the Wentworth Institute are men of skill and thorough knowledge who long since have discovered that it requires more than the average intelligence for one to become a skillful workmen in iron and steel. The chief instructor is Walter L. Winchester.

Goodyear Tire and Rubber Company

The annual meeting of the Goodyear Tire & Rubber Co. was held at Akron, O., December 4. Reports presented show that 1915 was the greatest and most profitable year in the company's history. In the election of officers which followed the reelection of directors, three individuals were rewarded, by conspicuous promotions, for their able services. Secretary G. M. Stadelman, who has been sales manager from the inception of the company, was made a vice-president. He continues as sales manager. P. W. Litchfield, who has been factory manager almost since the beginning, was also elected a vice-president. He will continue in charge of factory operations. The company thus has three vice-president, C. W. Seiberling, formerly vice-president, being reelected. A. F. Osterloh, assistant secretary, was elected secretary. He is also assistant sales manager. He began as a Chicago branch salesman in 1902. The other officers for 1916 are: F. A. Seiberling, president; F. H. Adams, treasurer; W. E. Palmer, assistant secretary and assistant treasurer; H. J. Blackburn, second assistant treasurer. The volume of business for the year was more than \$36,000,000, as against \$31,000,000 in 1914. President Seiberling stated to the stockholders that all indications are for a 50 per cent. increase for 1916. Factory additions of more than 11 acres, now being con-

structed, will make room for the increased working force required. The company made over 2,000,000 tires in the year just closed. A fine business is being built up in other lines. Neolin, replacing leather soles, is making more than satisfactory headway and the mechanical goods division is booming.

Briscoe Interests Taken Over by a \$6,000,000 Concern

A corporation capitalized at \$6,000,000 has taken over the Briscoe interests, of Jackson, Mich., including the Briscoe Motor Co., the Argo Co., the Jackson Motor Parts Co., Mason Motor Car Co., Waterloo, Ia., and the Jackson Metal Products Co. and all other interests associated with them. The new corporation has purchased the buildings and machinery of the Lewis Spring & Axle Co., but not the business of that concern, and 35 acres of land which will be used by the Briscoe interests in the manufacture of their products. For some time past the Briscoe Co. has felt the need of larger facilities to meet the steadily increasing demand for its product. Benjamin Briscoe is president and Frank Briscoe, vice-president in charge of manufacturing operations, while L. E. Willson, formerly of Chicago, but now of Jackson, will superintend the sales and advertising activities of the new concern. A production of 30,000 cars during its first fiscal year is contemplated, 15,000 of which will be the new light "four."

The Lewis Spring & Axle Co. advises that the Hollier 8 will be manufactured at the mammoth plant recently acquired by that company in Chelsea on an enlarged scale. The Lewis Spring & Axle Co. is an organization not affiliated with any other interests.

Carriage Builder Tries Suicide

Fred H. Sutter, 69 years old, a wealthy retired carriage builder of Williamsburg, N. Y., was found dying on November 26 in his home at 26 Grand street, with one end of a rubber tube between his lips and the other end fixed to an open gas jet. The discovery was made by his daughter. He was rushed to the Williamsburg Hospital where no hope was held out for his recovery. Miss Sutter informed the police that her father had been a long sufferer from cancer of the tongue and had several operations performed without success. Recently he had become very much depressed.

Creditors' Committee to Conduct Business

About 35 of the 40 creditors of T. P. Howell & Co., Newark, N. J., met recently and it was decided that the business should be conducted by a creditors' committee. Also decided to settle all claims amounting to \$400 and less. The creditors' committee will consist of five members who will act in conjunction with the Fidelity Trust Co., of Newark (which represents James Smith, Jr., owner of the tannery), as trustee. Mr. Smith predicts that the assets would exceed the liabilities by more than \$250,000.

Miller Joins Hicks & Hewitt

Roland Van G. Miller, formerly sales manager of the Hune Carriage Co., Boston, Mass., has been elected vice-president of Miller, Hicks & Hewitt, manufacturers of automobile bodies in New York City.

Wright Carriage Body Co. Expands

Beginning with the new year the Wright Carriage Body Co., of Moline, Ill., began the manufacture of commercial bodies for Ford cars. A sales and display office has been opened at 1625 Third avenue, where the company will do a retail business in its new output.

Eight models of commercial bodies are being made as follows: A, full panel body for delivery purposes; B, open express body; C, open delivery body with canopy top and curtains; E, open delivery body, with canopy top curtains and screens; G, open flareboard express body for roadster, and smaller body, also for roadster, and known as model H; K, Ford fire truck; L, casket body.

The fire truck is a feature of the new line, being described as a low-priced fire fighting equipment, suitable for town or city, maintained at low cost, and equipped with lanterns, axe, holders for fire extinguishers, nozzle holders, brass bell and space for 500 feet of hose. The company is making all the truck with the exception of the chassis. All the other models of bodies being manufactured are made to fit on the regulation Ford chassis. The fire truck body is to sell at \$440.

Three of the fire trucks have been sold to the Davenport fire department and two of them already have been delivered.

The Wright Carriage Body Co. is now employing 160 men ten hours a day and is operating at the rate of an annual output of \$500,000. This company did a larger business in 1915 than during the year previous. The last four months of 1915, in particular, says E. H. Wilson, secretary-treasurer, witnessed a large increase over the corresponding period for 1914. And this year he expects an even better showing than for 1915.

Willys Dined by New York Bankers

A dinner was given January 10 at Sherry's, New York City, in honor of John N. Willys, president of the Willys-Overland Co., by Elisha Walker, of William Salomon & Co. It shows the importance of the place in the industrial world occupied by J. N. Willys in the opinion of prominent men of finance.

Among the 63 guests were: Frank A. Vanderlip, president of the National City Bank and a director of the S. K. F. Ball Bearing Co.; E. H. Broadwell, vice-president of the Fisk Rubber Co.; Rathbone Fuller, L. G. Kaufman, president of the Chatham and Phenix National Bank, New York, and chairman of the finance committee of the General Motors Co.; A. P. Sloan, vice-president of the Hyatt Roller Bearing Co., Harrison, N. J.; Harry G. Fisk; H. T. Dunn, president of the Fisk Rubber Co.; Clarence A. Earl, vice-president and a director of the Willys-Overland Co.

Chicago Will Have a "Salon"

Chicago will have two shows during the week of January 22 to 29. In addition to the show of the National Automobile Chamber of Commerce at the Coliseum and First Regiment Armory, there will be a salon in the Auditorium Hotel. The following makes of cars will be exhibited: White, Simplex-Crane, Rolls-Royce, Lancia, Brewster and one or two others. These are practically the same makes that exhibited at Hotel Astor in New York.

White exhibited at the salon, because it withdrew from the N. A. C. C. show because of differing with the associa-

tion on the matter of drawing space. Many of the other exhibits of American cars, such as Locomobile, Cadillac, Owen Magnetic and Packard were made by the body builders and not by the companies themselves.

S. A. E. Officers

Following are the officers elected at the annual meeting of the Society of Automobile Engineers held in New York during the first week of January:

President—Russell Huff.

Vice-presidents—E. S. Foljambe, R. H. Combs.

Members of Council—To serve two years, David Bee-croft, E. R. Hall, J. G. Utz; to serve one year, G. W. Dunham.

Treasurer—Herbert Chase.

There were 550 present at the banquet held at the Hotel Plaza the evening of January 6, presided over by Wm. VanDervoort, president of the society. Among the speakers were General Wood, Secretary Daniels and Alfred Reeves, general manager of the N. A. C. C. The latter spoke of what the automobile should do in time of war. He pointed out to General Wood that the 240,000 automobiles in the state of New York alone should move 1,000,000 men over the roads at an average speed of 30 miles per hour.

Motor Truck Club of America Elects Officers

The Motor Truck Club of America, Inc., at its annual meeting on Wednesday, December 15, in the rooms of the Automobile Club of America, New York City, reelected T. D. Pratt president. The other officers elected are: C. Roderick Stephens, first vice-president; David C. Fenner, second vice-president; Haywood P. Cavarly, third vice-president; Nathaniel Mallouf, treasurer; Ellis L. Howland, secretary. The directors are: George H. Pride, James K. Orr, Emanuel Lascaris, Elmer B. Clark and A. J. Slade.

A discussion was held on the proposed Federal tax on gasoline, and it was decided that the executive committee take action and protest against the tax in the interests of the members of the club.

Banner Buggy Co. Reduces Its Capital to \$400,000

Simultaneous with the beginning of operations at the new St. Louis Chevrolet assembling plant, the Banner Buggy Co., part of whose plant was converted into an automobile factory, has announced a decrease of its capital stock from \$700,000 to \$400,000.

Mr. Gardner has converted a large portion of his buggy factory into an assembling plant and turned out the first St. Louis-made Chevrolet "Four-Ninety" on January 1. The local plant, Mr. Gardner says, is to supply the entire southwest and middle west with Chevrolet cars.

Dye-It

The little girl timidly asked the druggist for a package of pink dye. "What do you want it for?" responded the clerk, "woolen or cotton goods?"

"Neither," said the child. "It's for ma's stomach. The doctor said she'd have to diet and so she wants it a pretty color."

Trade News From Near and Far

Business Changes

Thos. Tifgham & M. Lundring bought the implement and vehicle business of Williams & Nystrom, at Canby, Minn.

Ronald F. Schaefer has purchased the implement and vehicle business of Pagelsen & Mendell, dealers at Hampton, Ia.

J. B. Baxter will enter the implement and vehicle business at Princeton, Ill., where he has bought out the store of his cousin, H. C. Baxter.

R. Rogers & Son is a new implement and vehicle firm at Grand River, Ia., and is successor to the business, stock, and good will of George Lloyd.

F. L. Johnson, dealer at Havelock, Ia., has bought out the dray line there and will conduct same in connection with his implement and vehicle business.

George H. Mick, a real estate dealer and landowner of Havelock, has bought out the big implement and vehicle store of Battershell Bros., at Pocahontas, Ia.

Mrs. M. L. Shaw has purchased the implement and vehicle business of J. H. Meyers at Bellmont, Ill., and has placed her son, Fred. T. Shaw, in charge as manager.

Hibberd & Ferguson, of Mason City, Ill., have purchased the implement and buggy business of Diers & Diers, at that place. Diers & Diers will continue in the automobile business.

Louis Koers, of Little Rock, Ark., has purchased the entire stock of buggies, wagons, harness, etc., of the Little Rock Carriage Co., and has moved the stock to his large fine repository.

C. A. Eilert, in the implement and harness business at Furley, Kas., has purchased the implement and hardware stock of E. B. White, at El Dorado. He will move the stock to Furley.

R. P. Dickinson & Bro., dealers in implements, buggies, feed and seeds at Bellefontaine, O., have dissolved partnership, Robert P. Dickinson retiring. The business will be conducted by John F. Dickinson.

Treckers & Phillips have succeeded Cosgrove & Cleary, at Odell, Ill. The new firm will continue the handling of hardware, stoves, buggies, wagons, agricultural implements and other farm equipment lines.

Adam Culp has purchased the entire stock of buggies, harness, robes, etc., from John H. Doering, of Wakarusa, Ind. Mr. Doering will continue in the automobile business, handling automobiles, tires and accessories.

Elrod & Co., manufacturers of wagons, vehicle and automobile material, have moved their plant from Columbia, Ky., to Erwin, Tenn. The new location is in the heart of one of the principal timber districts of the south.

New Firms and Incorporations

A new implement and vehicle store is being opened up at Melbourne, Ia., by John Wilt.

McConnell & Beck is the style of a new implement, vehicle, and hardware firm at Grand River, Ia.

Keith-Clark-Vance Co., Washington, Ind., has been incorporated with a capital stock of \$10,000 to buy and sell implements, buggies, harness and automobiles. The incorporators are Louis Keith, Jacob G. Clark and William I. Vance.

Fires

Ludwig Hodik's wagon plant at Necedah, Wis., was damaged by fire December 15, as the result of a conflagration in that town.

Spontaneous combustion is blamed for fire in the second floor of the C. J. Handel wagon works, Buffalo, N. Y., December 22. Damage is estimated at \$200.

Fire due to spontaneous combustion in a testing shed of the Chevrolet Motor Co., at Kingston Point, N. Y., January 7, did damage estimated at \$50,000. The building, a one-story brick structure, 100 x 65 feet, was gutted.

J. H. Johnson, implement and vehicle dealer at Stratford, Ia., suffered the total loss of his stock and building, estimated at from \$15,000 to \$20,000, in a fire on December 24; no insurance. Mr. Johnson will rebuild at the earliest possible moment.

News of the Trade

The Allen Motor Co., Fostoria, O., has increased its capital from \$400,000 to \$1,500,000.

The Reo Motor Car Co., Lansing, Mich., has increased its capital stock from \$4,000,000 to \$10,000,000.

The McLaughlin Carriage Co., Winnipeg, Man., will build an addition to its factory, 84 x 225 feet, three stories.

The Brockway Motor Truck Co., Corning, N. Y., is taking bids for its factory, which will be 40 x 186 feet, two stories.

The D'Arcy Spring Co., Kalamazoo, Mich., has plans for further enlargements to its plant, which will be made in the spring.

The Sparks-Withington Co., Jackson, Mich., manufacturer of automobile accessories, is building two additions, each 40 x 90 feet.

The Karges Wagon Co., Evansville, Ind., is on full time. It recently turned down a war order for wagons, owing to the press of domestic business.

A petition in bankruptcy has been filed by the Schley Carriage & Wagon Co., at Memphis, Tenn. The firm's assets were listed at \$3,750, and liabilities as \$3,089.

The Hess Spring & Axle Co., of Carthage, O., will award contracts in the near future for a factory addition. The new building will be 200 feet square and will cost \$40,000.

The Indiana Auto Radiator & Lamp Co., Indianapolis, has been incorporated by Louis Stein, A. Stein and J. Goldstein, with \$5,000 capital stock to manufacture metal articles.

The Chevrolet Motor Co. of St. Louis, St. Louis, Mo., has increased its capital stock from \$10,000 to \$1,000,000 and will enlarge the plant it has acquired from the Banner Buggy Co.

The Consolidated Car Co., Detroit, manufacturer of automobiles, has purchased the adjoining factory of Schweppe & Wilt. The building will add 100,000 sq. ft. to its present floor space.

The Mitchell-Lewis Motor Co., Racine, Wis., is installing a new 300 h.p. boiler and making other extensions of its power plant to accommodate an increased demand throughout its automobile shops.

The Royer Wheel Co., Aurora, Ind., has been incorporated with \$150,000 capital stock to manufacture wheels and vehicle accessories. The directors are L. T. Moore, L. N. Gatch and Robert A. Taft.

Joseph JoHantgen & Son, Bellefontaine, O., carriage manufacturers, announce the annexation of the automobile business to their established line of industry. They will also paint and repair automobiles.

Edward T. Birdsall, consulting and designing engineer of Detroit, will soon have ready for test a car for the Moline Plow Works, which is to build automobiles at the Henney Buggy Company plant at Freeport, Ill.

Ohio Spoke and Bending Co. has been incorporated at Botkins, O., to manufacture and deal in wheel and vehicle materials, capital \$40,000, by H. E. Sheets, F. S. Sheets, Clara Sheets, Helen B. Sheets and Phil Sheets.

An auto top manufacturing business has been started by Leon A. Henderson at Flint, Mich., in the building formerly occupied by the Flanders garage. Uptodate equipment has been installed. Radiator covers and side curtains will also be made and repaired.

The Scripps-Booth Co., Detroit, manufacturer of automobiles, has increased its capital stock from \$150,000 to \$350,000, to provide for its rapidly increasing business. Clarence H. Booth, formerly manager of the Studebaker plants, has been elected vice-president and managing director.

The Royer Wheel Co., Aurora, Ind., has been incorporated with a capital stock of \$150,000 to manufacture and deal in wheels of all kinds and vehicle accessories. The directors are as follows: Louis T. More, Louis N. Gatch, Robert A. Taft, Stephen H. Wilder and Williard W. Howe.

The Autocar Co., Ardmore, Pa., has increased its capital stock from \$1,000,000 to \$2,000,000, to take care of its increased business and has added James S. Austin, Ardmore, and Frank C. Lewin, who has been for some years assistant secretary and treasurer of the company, to its board of directors.

The Milburn Wagon Co., of Toledo, O., is getting a shipment ready which will represent the largest shipment of wagons ever forwarded to Central America. Most of the wagons will go to Honduras. Thomas W. Troy & Co., New York, are distributors of the Milburn wagon in Central American republics.

The Schwarz Wheel Co., Margaret street and the Philadelphia & Reading Railroad, Philadelphia, Pa., has purchased six acres of ground from the Keystone State Construction Co. on Shelmire street, near Tulip, Frankford, to provide for its increased business and output. It will be used largely for storage, etc.

The Connolly Carriage and Wagon Works, Waterloo, Ia., is erecting a two-story building adjoining its present building. The structure will be 60 x 70 ft., concrete blocks being used. Increased business has made it necessary to increase floor space. The new building will be devoted to the painting and general repairing of automobiles.

The Willys-Overland Co., Toledo, O., has purchased the old Conrad Stein brewing property, New York City, at 521-531 West Fifty-seventh street, through to Fifty-eighth street; and the intervening lot, and now controls a plot 150 x 200 feet. The buyer will build an eight-story service plant, at an estimated cost of \$300,000.

The Russel Motor Axle Co., manufacturer of motor car axles, North Detroit, Mich., increased its capital stock from \$150,000 to \$250,000, made necessary by extensions to its plant and machinery, which, when completed in March, will approximate an outlay of \$75,000, made necessary by the growth in its business. Geo. B. Russel is secretary and treasurer.

Among the Truck Manufacturers

The Columbia Motor Truck & Trailer Co., Pontiac, Mich., will build a plant 60 x 100 feet at Pontiac.

The Cadillac (Mich.) Auto Truck Co. has announced a new $\frac{3}{4}$ -ton truck to sell at a reasonable price.

The Federal Motor Truck Co. is erecting new assembling plant on Leavitt street, Detroit, at cost of \$10,000.

The R. L. Frome Mfg. Co., of Sheboygan, Wis., is erecting an addition 36 x 38 feet of concrete blocks, and will manufacture a new worm gear motor truck.

A. F. Mais has resigned as chief engineer of the H. G. Burford Co., Fremont, O., to become chief engineer of the Morton Truck & Tractor Co., Harrisburg, Pa.

The Kissel Motor Car Co., Hartford, Wis., is rushing work on a building, 74 x 316 feet, three stories, to be ready February 1. When completed, 250 to 300 workmen will be added to the payroll.

The G. A. Schacht Motor Truck Co., Cincinnati, O., is moving its plant from Spring Grove avenue to the manufacturing building at Gest and Evans streets. It will increase its manufacturing facilities.

The Motor Trucks, Ltd., Brantford, Ont., has been incorporated with a capital stock of \$500,000 by James Harley, Edmund Sweet, A. M. Harley, and others, to manufacture automobiles, motor trucks, etc.

The Commerce Motor Car Co., Detroit, maker of the Commerce truck, has increased its capital stock from \$100,000 to \$200,000. The earnings of the company are expected to total approximately \$70,000 this year.

The Autocar Co., Ardmore, Pa., manufacturer of automobile delivery cars, etc., is having revised plans drawn for the construction of a three-story brick and steel automobile body manufacturing building, 275 x 300 feet.

More machinery is being added to the equipment of the Duplex Power Car Co., Charlotte, Mich. Further enlargements of the plant are also contemplated. Business on hand will keep the plant running to full capacity well into this year.

The Iowa Motor Truck Co., Ottumwa, Ia., has recently formed for the manufacture of motor trucks. Two sizes are to be built of standard parts—one of 2,000 lbs. capacity, and the other of 3,000 lbs. capacity. The product is to be

known as the Iowa and will be marketed through the middle west.

The Hurlburt Motor Truck Co., of Forty-second street, New York City, has leased the old plant of the Mott Iron Works on the Harlem River and the Mott Haven Canal for the manufacture of motor trucks. Up to the present time the company has been manufacturing its trucks in Chicago, Ill., and Sharon, Pa., and will continue the plants there.

R. J. Tower intends to break ground in the spring for a motor truck factory at Greenville, Mich. The first truck has been completed at the Tower Iron Works in that city, and has met with such success in the testings that several orders have already been received. The concern will also manufacture auto accessories for Detroit auto manufacturers.

The Meyers Machine Co., Sheboygan, Wis., has filed notice of a change in its corporate charter to provide for a capitalization of \$50,000. It has taken over the plant and business of the Wisconsin Motor Truck Co., and has awarded contracts for the erection of a shop addition, 75 feet square, to be used in the building of trucks. The company will continue the manufacture of wood-working machinery.

The Blair Motor Truck Co., Newark, O., has been reorganized, and the \$250,000 in stock offered for sale has been heavily oversubscribed. The company now has a single order for motor trucks for European delivery which will run for five years, and represents a value of \$6,000,000. The order provides that 50 trucks each month shall be furnished as long as the war lasts, and 25 each month to the end of the five-year period.

In an item in this column in the December issue of *The Hub* it was erroneously reported that the light delivery wagon of the Bell Motor Car Co., of York, Pa., was equipped with a Bosch magneto instead of distributor ignition. The fact is no magneto is used at all, the car being equipped with the Atwater-Kent system with Disco generator and starter. The price of the flare board delivery is \$735, and the closed, or panel job, is \$780.

Fisk Takes Over Federal Rubber

Control of the Federal Rubber Mfg. Co., of Cudahy, Wis., has been taken over by the interests of the Fisk Rubber Co., of Chicopee Falls, Mass., who hereafter will direct the policies of the Federal company. Byron C. Douse has resigned as president and general manager of the Federal company and has disposed of his holdings, and H. T. Dunn has become president, with Benjamin H. Pratt as general manager.

At the stockholders' meeting the following directors were elected: H. T. Dunn, J. A. Kepperly, of Toledo; B. H. Pratt, H. A. Githens, R. C. Ward, of Milwaukee; H. G. Fisk, E. H. Broadwell, G. A. Ludington, E. M. Bogardus, of Springfield, Mass.

The officers, with Dunn and Pratt, include H. A. Githens, assistant general manager; H. G. Fisk, treasurer; R. C. Ward, secretary and assistant treasurer; and E. M. Bogardus, comptroller.

The two organizations will be maintained separately as to manufacturing and selling. The Fisk plant, which has about 30 acres of floor space, is devoted exclusively to pneumatic tires, while the Federal plant, comprising five

acres of floor space, not only makes tires but general mechanical lines, such as solid carriage tires, baby cab tires, hoof pads, rubber heels, matting, and the like.

Pratt, the new general manager of the Federal plant, has had a long experience in the tire and rubber business. He was identified with the Elastic Tip Co., of Boston, a company of which his brother was the head, and later was prominent in the Fisk organization, at one time as Pacific Coast manager. He knows trade conditions well, and under his management the company will extend its efforts in building up the jobbing and mechanical lines.

Timken Acquisitions

The Timken-Detroit Axle Co., Detroit, Mich., announces the acquisition of Joseph C. Regan, formerly assistant general superintendent of the Yale & Towne Mfg. Co., Stamford, Conn., who will be general factory manager; Charles S. Dahlquist, for the last four years chief engineer of the Lippard-Stewart Motor Car Co., Buffalo, N. Y., who will be shop superintendent of the Timken-David Brown Co., and will specialize on worm drive for motor trucks, and W. F. Taylor, a graduated engineer from Perdue University, lately associated with the Ross Gear Co., Lafayette, Ind., who will represent the Timken-David Brown Co. in a selling and engineering service capacity. The promotion of W. L. Gleason from assistant factory manager to assistant to the vice-president in charge of manufacturing is also announced. During the 13 years he was with the Yale & Towne Co., Mr. Regan, through his good work and careful supervision of all of their various plants, helped in a great measure to make a reputation for this concern of having one of the most efficient factories in this country.

Grant Patent Settlement

Judge Learned Hand has handed down a decision holding patent No. 554,675, granted February 18, 1896, to Arthur W. Grant, to be valid and infringed by the Goodrich Co. Robert C. Beatty has been appointed as master to ascertain the accounts, savings, advantages and profits made by the defendant and the amount of damages sustained. The Consolidated Co., which has been succeeded by the Kelly-Springfield Tire Co., is also to recover the costs of the suit. This litigation has been in the United States District Court for the Southern District of New York since July, 1907, when the suit was filed as one of a number all over the country against manufacturing and selling solid rubber tires of the side-wire type. This particular suit was originally brought against the B. F. Goodrich Co.'s New York branch, and was subsequently transferred to the parent company at Akron, when the latter took over the branch and operated it directly.

New Mitchell Travelers

The Mitchell Wagon Co., Racine, Wis., has announced the appointment of John D. Zachritz, of Rock Port, Ind., as traveling salesman in Indiana. Mr. Zachritz is experienced in the wagon business and has sold Mitchell wagons before. The Mitchell people also have secured Fay H. Wilkinson, of Owensboro, Ky., to assist J. K. Hemphill in Kentucky and Tennessee. Mr. Wilkinson is a veteran in the trade, having represented the Owensboro Wagon Co. for over nine years.

OBITUARY

Herman J. Bierhart, a former well known resident of Racine, Wis., died at his home in Syracuse, N. Y., on November 26. Mr. Bierhart was born in Syracuse and lived in that city all his life, with the exception of 15 years. For three years he was connected with the Racine Wagon Co., Racine, Wis., and for 12 years was superintendent of the Studebaker Wagon Co., South Bend, Ind. He is survived by his widow and four children.

Henry Binkley, president of the Binkley Buggy Co., at Tipton, Ind., died December 5. Mr. Binkley located in Indianapolis in 1873 and was engaged in manufacturing wagons for several years. In 1885 he moved to Tipton, where he was very successful in business. Surviving him are one son, two daughters and a granddaughter.

Xavier Heimlich, 72, a member of the firm of Zimmerman & Heimlich, wagon makers at Quincy, Ill., died at his home in that city on November 28, from paralysis and senility. Mr. Heimlich was born in Germany. Many years ago Mr. Heimlich became a member of the firm of Zimmerman & Heimlich, but had lived a retired life for the past 23 years. Besides his widow he leaves three sons, three brothers and a sister, residing in Germany.

Enos E. Kerr, 67, a retired carriage manufacturer of Louisville, died at the home of his son, Dr. L. H. Kerr, 3423 West Broadway, of nephritis.

Richard Kettewell, 76, superintendent of the James & Graham Wagon Co. factory at Memphis, Tenn., and for 45 years in the service of that company, died December 13. A widow, two sons and two daughters survive.

William Turner Lewis, 75, second vice-president of the Mitchell-Lewis Motor Car Co., and a pioneer wagon manufacturer, died December 30 at his residence in Racine, Wis., of apoplexy. Deceased was born in Utica, N. Y., and when but 15 years of age located in Racine. His first employment was with the Western Union Telegraph Co., and served as a military operator in 1864 at Etowah and Cartersville, Ga., until Sherman marched to the sea. In 1864 he married Mary Mitchell, daughter of Henry Mitchell, the wagon manufacturer. Later that year he became associated with his father-in-law in the wagon business which was then conducted under the firm name of H. Mitchell & Co. Two years later the firm name was changed to Mitchell, Lewis & Co. He took an active part in the management of the concern and assisted materially in building it up to one of the largest plants of the country. He continued as vice-president of the wagon company until it was merged with the Mitchell-Lewis Motor Co. and at the time of his death held the office of second vice-president. He served the city of Racine as alderman for one term and served as a delegate to the Republican national convention at Minneapolis in 1892. He was a thirty-second degree Mason and a member of the Baptist church. He was president of the Baptist state convention in 1891-1892. He also took great interest in the Y. M. C. A. and furthered the interest of that organization. He is survived by his widow and three children, two daughters, Mrs. G. W. Mosher, of Chicago, and Mrs. George B. Wilson, of Racine, and one son, William Mitchell Lewis, of Racine.

Welcome Whittaker, 60, manufacturer and principal stockholder in the Goshen Buggy Co., Goshen, Ind., died December 8, in the Harper Hospital, at Detroit, Mich., where he went a couple of weeks before for an operation. He had been in failing health for 15 years. His widow and one daughter survive.

Kentucky Wagon to Assemble Dixie Cars

At a special meeting December 31, a contract was approved whereby the Kentucky Wagon Mfg. Co. will assemble automobiles for the Dixie Motor Car Co. for a period of five years. The Dixie Co. will pay the wagon company a stipulated sum to assemble the cars and manufacture certain parts. R. V. Board, president of the wagon company, will be president of the wagon company's new enterprise. He announced to the wagon works' shareholders that they would be privileged to subscribe to stock in the automobile company on a pro rata basis.

WANTS

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PATENTS

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The list of the **WHOLESALE** and **JOBGING TRADE** is so arranged as to make it convenient to separate the association members from those not so recognized.

The **RETAIL HARNESS MAKERS** of the United States and Canada comprise the principal part of the Directory, arranged by State, Town and County, and in the large cities, the street and number is given. Those rating (approximately) over \$1,000 are marked.

A list of **HARNESS DEALERS** as distinguished from retail harness manufacturers, is also given. The value of this list to those who solicit the vehicle, implement, hardware and department stores will be readily appreciated.

A list is also published of Export Commission Merchants, giving the class of merchandise they handle.

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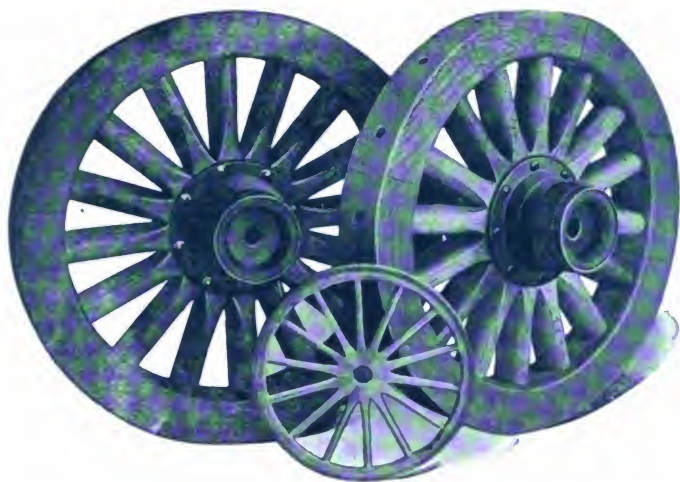
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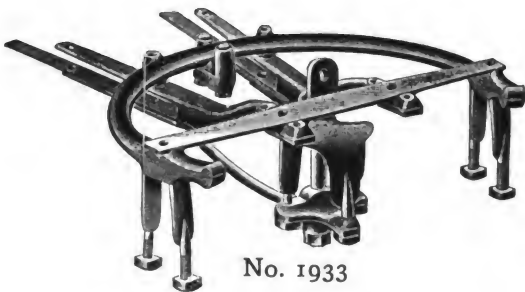
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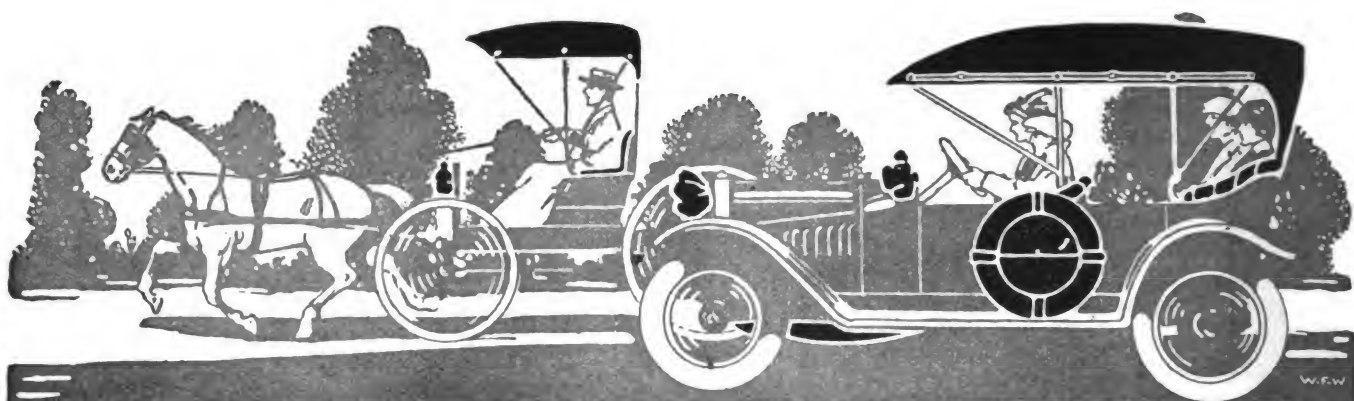
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FOREIGN REPRESENTATIVES:

FRANCE—L. Dupont, publisher of *Le Guide des Carrossiers*, 78 Rue Boissiere, Paris. Subscription price, 15 francs, postpaid.

GERMANY—Gustave Miesen, Bohn a Rh. Subscription price, 12 marks, postpaid.

ENGLAND—Thomas Mattison, "Floriana," Hillside avenue, Bitterne Park, Southampton. Subscription price, 12 shillings, postpaid.

Entered in the New York Post Office as Second-class Matter

Horse-drawn Vehicle Publicity

The attention of manufacturers, jobbers and dealers in carriages, harness and horse goods is called to an illustrated article appearing elsewhere in this issue entitled, "Good Advertising for the Horse-Drawn Vehicle."

The Vehicle Trade Press Committee of the Carriage Builders' National Association has done some excellent publicity work during the past year, and now an opportunity is given the individual members of the carriage and harness trades to contribute their mite toward emphasizing the horse-drawn vehicle by purchasing some of these posters and placing them where they will do the most good. Our readers are urged to get in touch with the committee for details and prices by writing A. M. Ware, chairman, 1010 Arch street, Philadelphia.

Fire Loss Growing

A concerted general resort to fireproof construction for all types of buildings is the only real remedy for our appalling annual fire loss. Statistics show that the awful total is steadily growing, in spite of all the achievements

of science and the horrible lessons of the past. When it really costs no more to design and build the fireproof way, but only needs a readjustment of the building methods, it does seem that means should be found to bring about this much needed reformation.

President Accepts the Tariff Commission

President Wilson's acceptance of the tariff commission idea, which probably means the passage of a tariff commission bill by this Congress, is a great triumph for the business interests of the country.

The Chamber of Commerce of the United States tested the sentiment of its members with regard to the commission, and the result was an overwhelming vote in its favor.

Practically the only criticism of the tariff commission idea comes from tariff partisans, including both high protectionists and free traders. The appointment of an unpartisan commission, clothed with suitable powers to investigate and report but not to recommend, will stabilize business in the United States by freeing it from the uncertainties of tariff agitation. It will go far toward placing this country in a position to compete successfully with other countries in the great foreign trade war which is expected to follow the military war.

Measuring the Brain

Just take out your rule and measure the size of your brain. Not all people can do this, but Chicago has a municipal psychopathic department which passes judgment on court wards and others and it is by measuring the brain under the Simon-Binet tests that the grade of the intellect possessed by the individual is decided.

The Simon-Binet system also, of course, embraces children and grown people in every line of life in its test. Children in school who are backward in their lessons have, it is said, proved to be geniuses in later life because of the system being put to work upon them in early life and their future having been mapped out accordingly. Others, children whose brains have been measured and who were considered to be possessed of talent for future greatness, have been put in the groove where they properly belonged, the Simon-Binet test deciding that their mark in life would be very low. And so it goes. We are judged sometimes by our free given expression—again by the expression of the face—by actions—by our associations and, of course, in a large number of cases, by the wealth we possess. But bringing it down to a real system which separates ability from deficiency, it is something distinctly new to the majority of us poor mortals who, if we only had a chance to be measured up in early life, and put in the right groove, our troubles would be lessened because we would then better understand that we were just in the fit place.

Rediscounting of Farmers' Notes

E. W. McCullough, secretary of the National Implement and Vehicle Association, has sent out the following communication:

We have obtained through James B. McDougal, governor of our local reserve bank, a most important ruling made by the Central Reserve Board at Washington on farmers' paper taken in settlement for implements, farm machinery and farm operating equipment. This ruling classifies it as issued for "agricultural purposes" entitling it to the privileges of rediscount on as long time as six months as provided in section 13 of the Federal Reserve Act.

The letter of the Board is as follows:

Federal Reserve Board.
December 30, 1915.

Dear Sir—In regard to your letter of December 21, inclosing a copy of a letter of the National Implement and Vehicle Association of the United States, dated Chicago, December 13, I beg to reply as follows:

The question which your Mr. McCullough puts is a very close one. The law permits the rediscount of six months' paper that has been "drawn or issued for agricultural purposes, or the proceeds of which have been used or are to be used for agricultural purposes."

There can not be any doubt that a bill drawn by a dealer on a farmer in payment for agricultural implements purchased by the farmer is a bill that has been "drawn or issued for agricultural purposes and the proceeds of which have been used or are to be used for agricultural purposes."

The question then arises—does such paper comply, in addition to this requirement, with those prescribed by the Federal Reserve Board by Regulation B, of which 11 (a) prescribes that "no bill is 'eligible,' the proceeds of which have been used or are to be used for permanent or fixed investments of any kind, such as land, buildings, machinery (including therein additions, alterations, or other permanent improvements, except such as are properly to be regarded as costs of operation)."

It is a very close question whether agricultural implements are to be considered as permanent improvements or as part of the cost of operation. However, it must be considered that machinery of this kind is not of a permanent character. It wears out rapidly and in most cases has to be replaced within a comparatively short time, so that it may be assumed that a certain amount of money would be spent annually and regularly for the purchase and replacement of machinery of this kind. As the Board by its regulations does not desire unnecessarily to restrict, but rather to encourage, the facilities to be given, as far as that may be done consistently with prudence, it would appear that the wider interpretation in this case should be given, and a ruling by the Board would appear entirely appropriate which "would permit notes and bills of exchange drawn by implement dealers on a farmer against a sale to him of agricultural implements, to be considered as drawn or issued for agricultural purposes."

This would answer in the affirmative Mr. McCullough's question (1):

"Are the notes of farmers or consumers given for the purchase price of farm tools, agricultural machinery or other farm operating equipment discountable under the section 13 of the Federal Reserve Act—providing for notes,

bills, or drafts, drawn or issued for 'Agricultural purposes?' "

Question (2) reads as follows:

"Will the fact that such notes, drafts or bills are presented by the dealer with his endorsement for rediscount, change their classification from the rating given them if presented by the maker (the farmer), if so, why?"

It is to be assumed that the clause permitting the rediscount of agricultural six months' paper was enacted by Congress for the purpose of giving special facilities to farmers. If the note were purchased from a dealer, it would appear that the facilities are not given to the farmer but to the dealer. However, there is no doubt that the language of the law plainly would permit the rediscount of such paper and inasmuch as, indirectly, the farmer would profit by the rediscount to the dealer, inasmuch as otherwise the farmer would have to borrow and probably borrow at a higher rate for a single name note than the money could be secured upon the double name bill of exchange drawn by the dealer—it is to be expected that the advantage of the lower discount rate and of the cheaper credit will indirectly result to the benefit of the farmer.

It would appear, therefore, that from every point of view, question (2) should be answered in the negative.

Question (3) reads:

"What provisions or marks of identification, if any, must be placed upon notes, drafts or bills to have them properly classified as 'issued for agricultural purposes' and render them discountable if their maturity does not exceed six months."

The nature of the bill, the name of the acceptor, and the name of the drawer, would probably indicate that a farmer was the purchaser and an implement dealer the seller of the goods. However, the purchasing member bank will have to satisfy itself in some satisfactory way that the bill is substantially of an agricultural character. A simple memorandum attached to the bill, stating that the bill was drawn in payment of agricultural implements, signed either by the acceptor or the drawer would probably be considered sufficient evidence by the member bank and the Federal Reserve Bank.

Question (4) reads:

"What is the limit, in amount, that a Federal Reserve Bank may rediscount of notes, drafts or bills where taken for 'Agricultural purposes' as provided in section 13?"

The law prescribes that in the aggregate that total amount of agricultural paper purchases by a Federal Reserve Bank should not exceed a percentage of its capital stock, the percentage to be fixed from time to time for each Federal Reserve Bank by the Federal Reserve Board. The percentage fixed by the Board differs in the various districts. Whenever a district has applied, the maximum limit has been granted, which has been considered to be 99 per cent. of the capital stock.

H. PARKER WILLIS, Secretary.

This ruling is so sweeping and definite the retail dealer should now have no difficulty in discounting his customers' notes and availing himself of his cash discounts.

Furthermore, it should furnish him his strongest argument in securing settlement from the farmer on the delivery of goods.

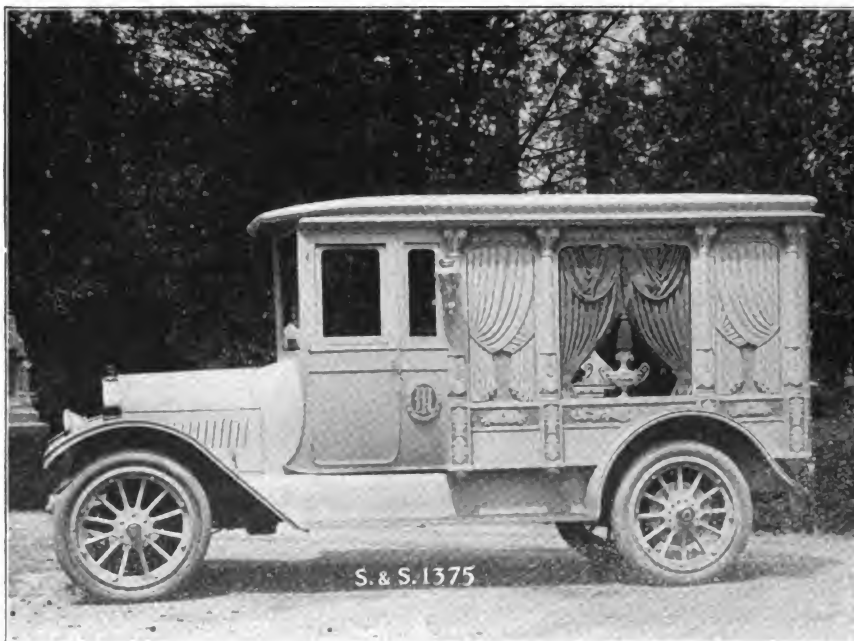
It is also a most important aid in making effective shorter terms.

Yours truly,

National Implement and Vehicle Association.
E. W. McCULLOUGH, Secretary and General Manager.



No. 51 CORNING BUGGY
Built by
MIFFLINBURG BUGGY CO.,
Mifflinburg, Pa.



AUTOMOBILE FUNERAL CAR
Built by
SAYRES & SCOVILL CO.
Cincinnati, O.



TWO TYPES OF MOTOR BUS

Built by
FITZGIBBON & CRISP
 Trenton, N. J.

Our Remarkable Lead in Motor Vehicles

In these days of quantity production, with the leading automobile manufacturers of the United States arranging for the turning out of a round million of cars during the present fiscal year, the question of what may be termed the automobile population of the world naturally arises. Where do these thousands of American cars and the additional thousands made in foreign countries go?

According to statistics just compiled by the Horseless Age, following its efforts to obtain an automobile census of the world, there are approximately 3,114,000 automobiles in use throughout the globe. This total seems astonishingly small when it is considered that the latest registration figures indicate that there are 2,400,000 automobiles in the United States alone. The United States has long been recognized as the foremost manufacturer and consumer of motor vehicles, but it remains for the tabulations of figures such as those mentioned above to illustrate this supremacy. Approximately 77 per cent. of the world's automobiles are being operated on the roads of this country.

An idea of the position the United States occupies in the motoring field may be gained when it is known that the 714,000 cars in service in other sections of the world represent less than the total of cars registered in the states of New York, Ohio, California and Iowa.

The war is one important factor in the connection with the compilation of these figures which has to be reckoned with, but which tends further to advance the standing of the United States as a nation of automobilists. The leading nations involved in this struggle include the foremost of the European automobile builders and users. In Great Britain, France, Germany, Austria, Russia and Italy practically all of the privately owned motor vehicles have been requisitioned for military service, in which their period of usefulness is decidedly limited. The absence of official figures on the number of cars in use in these countries makes it necessary to estimate the "motor population," using as the basis for this approximation the number of vehicles officially recorded before the war, adding the machines shipped from the United States to the various countries since the spring of 1914 and also including a moderate allowance for the vehicles made at home during the war period. In the latter consideration it must be remembered that in view of the fact that the various factories are in effect government controlled the number of cars produced for private consumption is indeed very small. In Great Britain practically all of the motor car factories have been converted into munition plants, but in France several of the automobile companies are permitted to assemble parts made before the war into cars for private use.

Many countries do not officially enumerate the motor vehicles within their borders, the figures collected having been obtained from reports from consular officers and United States government exports statistics. The United States, of course, ranks first, having more than three times as many cars as all the other countries combined. Great Britain comes second with its 276,690 cars, which represents about one vehicle to every nine in this country. France and Germany occupy third and fourth places, respectively. It is interesting to note in connection with these four countries that their standing in the automobile manufacturing line is relatively the same as that given for consumption.

Canada has never been a quantity manufacturer of automobiles, but has always been the heaviest purchaser of cars made in this country. In the last few years several American manufacturers have established plants in the Dominion where cars are assembled. Most of these cars, however, have been made for export purposes, the Canadian assembled machines getting a preferential tariff over the United States cars when being shipped to the British colonies.

Draught Horses in Great Demand in New York

Enormous exports from this port and reviving trade and industries all about New York are making a demand for high grade draught horses such as dealers last spring little expected to see before the close of the year, says the New York Herald. Trucking concerns which handle the mountains of freight coming in on the railroads and going out on the steamships are buying heavily to keep up with the demands of their business, and manufacturers, wholesale and retail establishments, coal dealers, contractors and everybody who uses big horses seems to be in the market just now for fresh teams or for more teams. M. J. Scully, general manager of the Fiss, Doerr & Carroll Horse Co., said that he had not seen such a demand for high grade draughts in six years. Mr. Scully gives his personal attention to this end of the company's diversified business, and is in closer touch with trade than almost any other man in the market.

"It has seemed like old times here in Twenty-fourth street this winter," he remarked to a reporter of the Herald. "Customers who were sending horses to the auctions because they couldn't find work for them a year ago are now buying right and left, and a lot of new people are coming into the market. Some of them tell us they have been using motor trucks and are going back to horses again."

"How about the supply of big horses? Are they as easy to buy as they are to sell?" he was asked.

"The good ones never were harder to buy than they are just now," Mr. Scully replied. "The rough, nondescript kind they are taking for artillery and transport work in the war are plentiful enough, as such horses always are, but when you go out west and try to find a carload of smooth, snappy Percherons, weighing from 1,600 to a ton, with finished heads and necks, good, deep middles and clean, hard looking legs and feet, and plenty of bone, you will think you have done something by the time you get them together. The prosperous western farmer seems to be selling off the poorest horses for the war in Europe and keeping his best ones to do his own work. He can afford to nowadays. This makes it mighty hard to buy the kind our customers are asking for, but we are not letting the farmers keep all the good ones."

American Aeroplanes for Java

Two American aeroplanes, purchased by the Dutch Indian government at Los Angeles, arrived at Batavia the latter part of October, and a number of successful trial flights have taken place within the past few weeks when an elevation of 3,000 feet has been reached. It is reported that should the two machines be found satisfactory, others will be purchased from the United States.

Manufacture of Automobiles

Census Bureau's Summary Concerning the Industry for 1914

A preliminary statement of the general results of the 1914 census of manufactures for the automobile industry has been issued by Director Sam. L. Rogers, of the Bureau of the Census, Department of Commerce. It consists of a summary comparing the United States totals for 1909 and 1914, prepared under the direction of William M. Stewart, chief statistician for manufactures.

The figures are preliminary and subject to such change and correction as may be necessary from a further examination of the original reports.

The returns show that during 1914 there were in the United States 338 establishments manufacturing complete automobiles, their output being 573,114 machines, valued at \$465,042,474. Thirty-eight of these establishments were engaged primarily in the manufacture of bodies and parts, agricultural implements, and other products, and reported the manufacture of complete automobiles as a subsidiary product. In addition there were 12 establishments which manufactured 20 cars, either for experimental purposes or for their own use, upon which no market value could be placed.

At the 1909 census 315 establishments were reported as engaged in the manufacture of automobiles either as a primary or as a subsidiary product; and their output was 127,287 machines, valued at \$165,099,404. During the five years 1909-1914 there has been an increase of 350.3 per cent. in the number of automobiles manufactured, and of 181.7 per cent. in their total value. The fact that the increase in value of output during the five years was much smaller, relatively, than the increase in number of machines made is accounted for not only by a general reduction in prices, but also by the production of a larger proportion of machines of low-priced makes in the later year as compared with the earlier.

Of the total number of automobiles manufactured during 1914, those operated by gasoline or steam power numbered 568,399, and those operated by electric power, 4,715, as compared with 123,452 operated by gasoline or steam, and 3,835 by electric power, manufactured in 1909. The increase during the five years in the number of gasoline and steam machines manufactured was thus 360.4 per cent., and in the number of electrics, 22.9 per cent.

Touring cars formed the principal type manufactured during both census years. In 1914 the output of this class of machines was 454,876, valued at \$351,585,518, compared with 76,189, valued at \$113,510,575, in 1909. Of the total production for 1914, the number designed for pleasure or family use was 544,255, compared with 119,190 in 1909. For business purposes and for use as public cabs, omnibuses, ambulances, patrol wagons, fire-fighting machines, and for other business purposes, 24,144 machines were manufactured in 1914, compared with 4,262 in 1909. The output of delivery wagons and trucks was 22,753 in 1914, compared with 2,771 in 1909.

The report also classifies the gasoline and steam automobiles manufactured in 1914 according to their horsepower. The production of vehicles of less than 10 horsepower amounted to only 391; of from 10 to 19 horsepower, to 45,116; of from 20 to 29 horsepower, to 346,399; of from 30 to 49 horsepower, to 163,468; and of 50 horsepower or more, to 13,025.

The figures shown above do not represent the number of establishments nor the value of products of the entire automobile industry, but only the figures for establishments making complete automobiles. In addition to these establishments there were a large number engaged in the manufacture of automobile parts and accessories, and the statistics for the establishments that manufactured the complete machines do not represent the extent of the industry. The value of automobile tires made by establishments in the rubber industry is very large, and many of these tires, as well as other parts and accessories, are sold to repair shops and automobile owners, and therefore do not appear in the value of products of the automobile industry.

Comparative summary of number of automobiles manufactured, as reported for the censuses of 1914 and 1909

Type	Census 1914	1909	Per cent. of increase, 1909-1914
Gasoline and steam*	568,399	123,452	360.4
Family and pleasure	544,255	119,190	356.6
Touring cars	454,876	76,189	497.0
Delivery wagons and trucks	22,753	2,771	721.1
All other	1,391	1,491	16.7
Electric	4,715	3,835	22.9
Total	573,114	127,287	350.3

*Returns were received from only two establishments making steam automobiles in 1914. The statistics for these companies are consolidated with those manufacturing gasoline automobiles in order to avoid the disclosure of their operations.
†Decrease.

German Gasoline Supply

Estimates of the supplies of petroleum that are available for use by the Germans indicate that throughout the war a very considerable amount has been supplied to them.

Engineer Guiselin, secretary of the International Commission on Petroleum, has recently made public in Paris an estimate of these supplies. Before the war there were large stocks in storage in Germany and the Germans have been able to use the products of the fields in Roumania, Alsace and Hanover, and with the exception of the time during which the Russians occupied Galicia—of the Galician fields as well.

Before the war Galicia was producing 72,000 tons a month and during the early months of the war this was increased to 89,000 tons. The Russians are known to have destroyed 229 wells during their occupation, but many were not destroyed and those put out of commission have doubtless long ago been restored.

Roumanian exportations of petroleum in 1914 amounted to a million tons. A large amount of the capital employed in the operation of the Roumanian fields is German. Germany is the third consumer of petroleum in Europe and before the war was taking in 120,000,000 tons annually.

Roumania has enforced a decree forbidding the exportation of those parts of the crude which can be used for motor spirits or the lighter oils. The figures indicate that while Germany has been inconvenienced by the shortage of the supply and has been forced to develop intensively the wells in her field of influence, she has still in all probability been able to get whatever she needed for her army.

Lehr to Build Saginaw Eight

The Lehr Motor Co., Saginaw, Mich., has been formed with a capital of \$500,000 to build the Saginaw Eight at \$1,050. The designer and general manager is Harry D. Mackey; president, William M. Guilder; vice-president, F. F. Myer, and secretary and treasurer, K. M. Schwahn.

Trend and Possibilities of Automobile Design*

By A. Ludlow Clayden and L. V. Spencer

The effect upon the French trade of dropping their exhibition as an annual affair, in going three years or more without it, was to let French automobile design drop back, allowing England to take the lead. Perhaps it was not an effect, but merely the two things happened simultaneously, but however this may be, there is absolutely no doubt that the quality of French engineering improved a great deal within two years of the resumption of annual shows.

The American show as a spectacle loses greatly on account of the lack of buildings with a single large spread of floor. It is much less impressive at first glance than either the British or French show. Of course, the latter is housed in one of the finest buildings in the whole world, such a building as Chicago and New York ought to possess and no doubt will some day; but it is not fair to blame the building on the exhibition.

As an engineering display, there is nothing to choose between America and France, but the palm goes to England, solely for the reason that the Olympia show is the most thoroughly representative. In London there appear all the British cars, all the French and Italian cars that are of any importance, and quite a number of American cars. At Olympia the cars of all nations are on view.

Leaving all consideration of price on one side, American automobile engineering has reached a high pitch of development as compared with the rest of the world, so in offering criticism it is with the idea that by being dissatisfied with what we have it may be improved still more. A state of perfect contentment with the automobiles of 1916 is greatly to be desired on the part of the user, but it would be most unwise on the part of the engineer. We are not going to be at the end of passenger car chassis development within ten years, nor within 50.

During the past year we have seen a situation unparalleled in the history of the industry, because we have been trying both to increase the volumetric efficiency of engines while simultaneously trying to cheapen them. This attempt has been successful almost entirely by reason of greatly improved design. Positive figures are lacking, but it is safe to say that never before have so many completely new engines been designed in a single year.

The Cylinder Question

It is very tempting to examine the motors of the cars at the 1916 shows and to argue therefrom that the idea of limited individual cylinder capacity has been vindicated. The idea that the eight, the twelve and the six, to say nothing of the four, have each their proper place in the sphere of things, assuming that there is a best individual cylinder size, is well borne out by the shows.

One thing is without doubt, and this is that the much better performance of the average six is due to the coming

of the eight and twelve. The six-cylinder engine, as seen on show chassis, is much neater, much more compact and distinctly better finished than was the average six of 1915, and the performance on the road and the speedway of the 1916 sixes shows that this appearance is not misleading. Howard Coffin said on board the Noronic this last summer that he thought the coming of the V motor would force American manufacturers to produce some good sixes, and certainly they have done it. Are we at the end of development along this line? It is easy to say no and almost equally as easy to say yes; but he would be a bold man that would dare to stake his fortune one way or the other.

It was only when the twelve was evolved that the cylinder question could reach its limit. There is nothing to be gained in theory, in going beyond this number, unless we turn to rotating cylinder engines of the Gnome type, so now at last we have all possible sorts of cylinder arrangement before us, from four to twelve. For the first time the cylinder question can be left to the public to work out for themselves, and how they will do it no man knows.

Now, while there is nothing more satisfactory than the small-cylinder four in a little car, it is absolutely essential that it be kept in good trim, or the power falls off woeefully, and in the same ratio an eight or twelve with minute cylinders will need to have its valves maintained in proper adjustment, to have every detail kept in proper condition.

Much has been written about accessibility and much more been talked during the past year, but however necessary it may be to maintain, from a sales point of view, that eights and twelves are easy to keep in good tune, an engineer cannot blink the fact that an L-head engine of V formation is horribly inaccessible as compared with a vertical-cylinder engine of the same standard of engineering. The main factor in keeping the little cylinder at good efficiency is maintenance of proper tappet adjustment. The average owner of an automobile, whether in this country or any other, is not capable of adjusting the ordinary kind of tappet, with a set screw and lock nut. The smaller these parts and the smaller the valves, the more difficult does the adjusting process become. On a vertical engine where the valve stems are quite clear, the average man cannot tackle them; on a V engine his case is infinitely worse. Thus there is reason to believe that the success of the small eight and of the small twelve is largely bound up with the possibility of improving their ease of adjustment.

In an overhead-valve engine with valve adjustment on the rocker fulcrums it is possible to adjust the tappets while the engine is running, and the job can be done quickly and easily by the least skilled, once the method has been explained, and it can be explained easily in writing without demonstration. There are many pros and cons for the valve-in-head construction, but if so facile

*Extracts from a paper presented at the meeting of the Detroit Section, Society of Automobile Engineers, February 16, 1916.

an adjustment can be provided for this type of engine, why not for the L-head variety? We have held to the old-fashioned methods too long, so valve mechanism, especially as regards adjustability, may be written down as one of the problems of automobile engine design that remain to be overcome.

Lubrication and Cooling

Another part of engine design that is imperfect is lubrication, though this is being improved by slow degrees. Signs are not wanting that a proper proportioning of the oil supply to the pressures prevailing in the engine at the moment is a growing ideal, and its general adoption cannot fail to bring about a considerable oil economy together with a decrease in the rapidity of carbonization. In this connection it may be questioned whether the most advantageous feature of the aluminum alloy piston will not ultimately be found to be the ability to make it long without greatly increased weight. This matter of long or short pistons, of the long piston as a preventive of overlubrication of cylinders, versus the short piston with other means for keeping down the oil, must be threshed out this year. This year we have got to do our utmost to evolve some standard pistons, for the modern methods for making pistons would be facilitated enormously by the creation of a half dozen standard sizes. The problem is difficult, but it is not nearly as difficult as many others the S. A. E. has tackled successfully.

Turning to the cooling system of the engine, we see syphonic circulation—or, more correctly, convection cooling—growing in favor, but study of the cars at the shows discloses the fact that the pump has often been discarded without proper appreciation of the conditions under which a convection system of cooling works. In a system of this sort we have always the hot water at the top, and the cold at the bottom, and if the cylinders are situated at a level with the middle of the radiator they will have approximately the same temperature as the middle of the radiator; in other words, the part of the radiator below the level of the cylinder jackets is useful only as a water tank and has little value as a radiator. With convection cooling a high radiator and a low-priced motor are essentials for success unless a great deal more water is carried than is really necessary. Another much neglected point is the necessity for providing a good head of water at the top of the radiator. As soon as enough water has evaporated to uncover the outlet pipe from the cylinders at the point where it enters the radiator, circulation theoretically ceases. Practically, it does not cease for some time longer, because the water around the valves boils vigorously and the steam thus formed throws the water into the radiator by a splashing action like a kettle boiling over through the spout. Modern ideas of beauty make it difficult to provide a water container at the top of the radiator that is at least 4 or 5 in. deep and 4 or 5 in. of water are essential if a convection system is to be really satisfactory.

Aluminum and Its Advantages

The future of the aluminum engine seems to be entirely bound up with the price of aluminum. Let aluminum come down to under 20 cents a pound, and its cost would be little greater than that of cast iron, when the greater ease of machining is considered. There are a few optimistic spirits who think it is only a matter of finding the correct alloys to be able to use an aluminum cylinder and piston without an iron liner, but whether this be so

there seems little doubt that the aluminum cylinder is going to make it easier to keep the small multi-cylinder engine in good order. When dealing with high pressures and temperatures, such as prevail in engines with a large power-size ratio, nine-tenths of the trouble is due to heat. Now, the parts from which we want to remove heat with the greatest possible rapidity are the valves and the pistons. The success of the aluminum piston in racing is explained by the fact that its head keeps cooler than that of an iron or steel piston. The walls of the aluminum piston may be actually hotter, but the better conductivity enables the maximum temperature at any part of the engine to be kept within bounds. So with the aluminum cylinder, the temperature of the water should be the same as with iron castings, but the difference in temperature of the parts exposed to greatest heat, which are the valve ports, and the parts best cooled, will be smaller. In other words, the aluminum cylinder ought to allow us to use a high efficiency engine with a smaller liability for trouble.

Aluminum may possibly develop some defects after long use as a cylinder material. We may find that it deteriorates with prolonged heating, but experiments have been made for long enough now to make this doubt a very small matter. Cheap aluminum is all we ask to enable us to save weight and increase efficiency without increasing liability to trouble.

There are plenty of other points about engines outside the number of cylinders they may possess. Foremost in impression after looking at a show is the number of detachable cylinder heads, and this seems a step forward from two viewpoints. First, as befits the engineer, the theoretical may be mentioned, and this is that it is easier to cool the spark plugs properly when they screw straight into the waterjacket than when they are attached to uncooled valve caps, and the elimination of valve caps ought to increase slightly the volumetric efficiency of the engine.

Secondly, as befits the commercially minded, the detachable head is a simply prodigious advantage to the owner who wants to grind his valves or scrape his cylinders and pistons. In nearly every case half this advantage is thrown away by making the detachable head in one piece. To lift a single-piece head off a good sized six needs some effort, and it is a clumsy thing to handle when it is off; whereas, if it is divided into two portions, either is readily handled. Also, the amateur is none too skilled in making gas-tight joints, and the larger the single gasket, the more likely is he to go wrong.

Having due regard to the fact that the forming of carbon deposit is the chief trouble from which the owner suffers, it seems wise to make a feature of the easiest possible means for opening up the combustion space of the cylinder, and this is a point of design that has hardly been touched. Even where a divided detachable head is used the number of nuts to be unscrewed is excessive, and there surely ought to be some easier way of securely attaching a loose head piece than by nuts and studs.

Manifestly a dog piece with a single screw, like a tappet retainer, is not practicable, since it calls for too great a rigidity on the headpiece itself, but there are two unexploited alternatives. Could not the nuts and studs be replaced by cams operated by a small lever, or probably still more simple, could not a system be devised whereby the driving in or out of a few small wedges with a hammer would suffice to secure or to release the head? The

day has come when the owner's convenience in this sort of way is more worth studying than any other new thing that offers.

Trend Toward Smaller Cylinders

One thing stands out prominently above all others, and this is that all automobile development has been toward smaller cylinders and higher speeds. To this development there must be a limit, as to all other things, and it is difficult to see when we have reached it and when we have passed it. Today, taking a very broad average of the whole world, it certainly appears that the 3 to 3.25 in. bore and the 4.5 to 6 in. stroke were the economical limits. That a compression of about 75 lbs. gage was a happy mean, that a horsepower peak at about 2,000 ft. per minute piston speed was the all-round best thing. Leave every factor alone, and one might venture to say that these things positively are correct, but we cannot tell what will happen to bring in another factor.

For example, during the year the number of cars with overhead valves has decreased, but this may easily be misleading when endeavoring to estimate the trend in valve construction. Those that have gone have mostly been old designs, old types that were not so good as the modern. Simultaneously we see several new overhead designs produced that are infinitely superior to the old types. The latter have not yet had time to make their influence felt; it will take a couple of years more for them to establish themselves or to fade away, and so the trend figures again must be examined with care.

A point worthy of consideration and of debate is how much further the inclosure of accessories is going to be carried. Block cast, integral cylinders and crankcase as universal practice in automobile engineering seems a certain development, especially if we get the aluminum cylinder as conventional design. The better cooling now generally provided, again to be assisted by aluminum cylinders, will draw us back again toward the integral intake passage. The bell housing is destined to become universal, unless trends are altogether wrong up to date, and control mechanism of all sorts is being steadily unified into some sort of assembly that is complete in itself. One may ask whether we shall borrow further from the Italian school of engineering, and inclose the electrical apparatus, as is done on the Fergus car, or whether the housing for the steering gears will become integral with the crankcase? There is, however, one detail of the engine that may possibly be separated from the unit of which it is now usually a part, and this is the oil pump. As temperatures in the combustion chamber are increased, the necessity for cooling the lubricant increases. Cold oil is vastly more efficient than hot oil, as has been demonstrated beyond question. In the Stutz racing engine the oil pump is a separate assembly and the whole pump is exposed where it obtains the advantage of the air current.

Advantages of Electric Transmission

While interest centers mainly upon the engine, it must not be forgotten that there are other parts of the chassis equally worthy of consideration. That the present form of gearbox and clutch will change but little in the next few years is almost certain; it is as certain as anything can be in so rapidly expanding a branch of engineering; but electric transmission is not to be dismissed with a scornful smile.

Today the gas-electric system is in the same state of

infancy that the internal combustion engine was in 1900. There are a few enthusiasts who believe in it, and they may be just as correct in their belief as was the similar small band who believed in the motor car 16 years ago. In 1912 there were many good engineers who thought we had developed the automobile nearly to the limit, and how wrong they were time has shown. The electric transmission enables us to get rid of the need for providing the amount of excess power necessary to give the high-gear performance now considered necessary. It allows the minimum speed of the gasoline motor to be several hundred revolutions per minute higher, so easing the carburetion problem, and it allows higher average gearing to be used with a large engine, or a smaller engine with the same gearing we have today.

Brakes and Steering Can Be Improved

However, to leave the visionary and return to the very practical, there are two things in which the average car of 1916 is lacking, and two important things—first, the brakes, and, second, the steering. While engineers of all countries have been devoting their time and study to making the automobile go forward, few of them have given much attention to the equally important matter of keeping it under proper control. The car of 1916 is much faster than the car of 1904, yet it is practically no easier to steer or stop.

In designing brakes, the mathematics of the question ought to be considered, and then should be followed by proper tests of brake-surface materials, of details of shoe design, and so on. A brake ought to act smoothly and quietly, and without more than 20 lbs. of pressure on the pedal. It ought to remain in perfect condition for at least 10,000 miles of driving, and when adjustment is needed it ought to be made by turning a single thumb nut. It is possible to make brakes like this, but it is not easy, because so very little is known about the fundamentals of the subject.

Furthermore, it is fundamentally wrong to put all braking restraint on the rear wheels, and since the theory of front wheel brakes is not too generally understood, it may be permitted to explain this briefly.

When a brake is applied the car as a whole tries to turn around on the axle; so applying a rear-wheel brake puts on a torque which is resisted by the pressure of the front wheels on the ground, they forming the other end of the lever. If the adhesion of the rear wheels is sufficient, so that one of them locks, that wheel is instantly useless for steering, and if the second locks the whole axle cannot be steered.

With front-wheel brakes the tendency of the application is to lift the whole car, so throwing more weight on the front axle and so pressing the wheels harder against the ground, which reduces the liability to lock the wheel, since the adhesion is increased. But—and here comes the whole difficulty—if front-wheel brakes should be applied with sufficient force to lock the wheels, all steering power is lost, and the fact that the two rear wheels are still rolling freely does not help in the least. Thus in theory the ideal arrangement is to link the brakes diagonally; to have a brake on each wheel with the right-hand front interconnected with the left-hand rear and the left front to the right rear wheel. Then apply the brake however fiercely on either axle and there is at least one wheel that is rolling free and able to control the course of the car. Repeated

tests both on models and on full-size cars have shown this diagonal system to vindicate the theory completely, the only trouble being in the mechanical layout of the connections for applying brakes in this way. As may be imagined, the linkage is somewhat complicated, and it remains still for some clever engineer to find a way out.

Steering is faulty on the average car, because it requires too much effort. There is too much power lost in friction; and it also is inefficient because of absence of true castor action. The mathematics of castor steering are not complicated, but they admit plenty of room for discussion. While the front wheel with a central pivot, raked a little fore and aft, is the ideal, there are other ways of obtaining a similar effect; and it only needs to drive a car with perfect steering to appreciate what an enormous amount of additional pleasure it gives.

Few Cars Comfortable for Driver

Turning to quite the other end of the matter, another point that impressed most strongly at the show was the extremely small number of cars in which the seating was truly comfortable—that is, comfortable for an individual of normal stature. The number of cars in which an average-sized driver can sit at the wheel in an easy attitude when wearing a thick coat is almost to be reckoned on the fingers of two hands. There is a strong tendency to crowd the front seat right up against the cowl board and to stretch out the tonneau till the rear-seat passenger needs a megaphone if he is to be able to speak to anyone in the forward compartment. There has been a great wave of endeavor to make the body better looking from the outside; now it is time to turn to a rearrangement of the interior. That this is commencing is obvious. The cloverleaf body is the logical swing back of the pendulum from the "ball-room" style of tonneau, and it seems likely that the ultimate result will be a happy mean between the two. There were two cloverleaf bodies in New York that were comfortable for four people—and only two.

Today in Europe the wire wheel or the pressed steel wheel is the rule, wood wheels are the other thing, mainly because has not got the right sort of wood. But the introduction of aluminum or celluloid disks to attach to wire wheels has led to the adoption of these disks for attachment to pressed-steel wheels also. A wire wheel is hard to clean even though it is mechanically superior to any other kind, and these disks make it into the easiest wheel to clean of any; so it looks just now as though disk wheels would become common in Europe. A disk wheel has many good points in its favor. It is simple to make and can be made very strong, while it can also be cheap to construct. Against it is the popular idea of what a wheel ought to be. Fashion has been conquered so many times that it counts for very little now; so the disk wheel, as a strong, simple and cheap idea, ought to be worth investigating. Probably the wire wheel by virtue of its mechanical excellence is going to be the ruling thing; but whether the disks are the true wheel or merely a wire wheel cover, their advantage when it comes to cleaning is well worthy of consideration.

Why Not Enclose Springs?

Another matter of design that seems to be in a doubtful state is that of springs. A year ago we heard all sorts of absurd claims made for the cantilever, rebutted by equally absurd arguments against it. Today we see all sorts of springs giving just about the same service. The type of

spring used on the Marmon and the Moline shows that there is still a possibility of new ideas in spring suspension, so this stands out as one of the things in which uncertainty still obtains. In the Fergus car, shown at New York, we see yet another spring idea that has waited for years to bring forth and is yet the simplest of common sense when you see it. Why not inclose a spring so as to keep it in its original condition of efficiency instead of leaving it open to the attacks of water and grit, which steadily reduce its efficiency, beginning from the first day the car goes on the road? Argued from this viewpoint, you might as well make a transmission with exposed gears as Levassor did for the Panhard company 18 years ago.

The subject upon which this paper is based is too large to do more than touch upon at present, but there are a few things beyond the little details already mentioned that are worthy of the engineer's occasional consideration. One possibility almost untouched is the two-stroke engine. The two-stroke seems a rational development, and yet it does not come. To many of us it is an everlasting puzzle to give the reason.

Those idle strokes in a four-cycle engine are poor engineering. It is poor science from the heat-engine theoretical viewpoint. So, too, is the scavenged exhaust. The idea of leaving a third of the burnt gas in the cylinder to contaminate the fresh charge is bad from the ideal viewpoint. Yet in 20 years of trial nothing has been done that seems likely to exercise a great effect on automobile engines. There has been no special difficulty in the development of the two-stroke Diesel engine, and the four-stroke Diesel at least does scavenge properly, but the basic principle of the engines that drive the automobiles of 1916 is unimproved from that in use in 1896. If one sits down and ponders this point, the conclusion that we have not done all we might have done is inevitable.

The best engines now made could not be smoother in action, they could not be much less trouble to look after, they could not be much more durable or much more reliable. There are only two criticisms that can be leveled against them, and these are: (1) They could be lighter in proportion to their power; (2) they certainly could have a much higher fuel efficiency.

The Carbureter and Cheaper Fuel

The second count is divisible into two sections. The present-day engine could utilize a cheaper fuel. If we have reached the limit of smoothness in operation, if we are near the limit in volumetric or in weight efficiency that is commercially possible, are we not also on the edge of what is possible with the carbureter as we know it?

It is easy to argue about reasons for the high price of gasoline, but whether it be due to a real shortage of supply or caused by financial manipulation of the market, the fact remains that we could run our cars much more cheaply if they would burn a heavy grade of kerosene. We have developed the really marvelous automatic carbureters of the day by lavish expenditure, and not a thousandth part of the money has been given to trying to find out how to use heavy oil in small engines. The automobile engine has been developed at such a wonderful pace largely because its fuel was comparatively easy to convert into gas; but we have done next to nothing to develop engines that will use fuels not readily gasified, to develop carbureters or similar devices for making gas from heavy oil. There seems no reason why the problem should be

any more difficult of solution than many others automobile engineers have attacked and overcome in the past ten years. Is it not a worthy subject for study and experiment?

Maintenance Should Be Reduced

It was impressive to anyone on the lookout for sales arguments that hardly a stand attendant or salesman had a word to say on the running cost of his car. Nobody seems to be making this a strong point, yet it must be the most important point of all, ultimately.

In reducing maintenance cost there are two chief things for which to work, one the reduction of weight, and the other the reduction of frictional loss in transmission. On the weight reduction scheme we are well started, and shortage of material is going to assist greatly in this direction. On frictional resistance hardly a beginning has been made. Excellent ball bearings and excellent roller bearings are bought and their efficiency thrown away by improper mounting or by careless assembly, and few of use ever pause to consider that a huge amount of power thus runs to waste every day. As a show attraction, it seems there should be a good opportunity to arrange a car in some way that will enable the pressure needed to start it moving to be demonstrated, something after the way in which one car at the 1915 show was exhibited on a scale which showed its actual weight.

In conclusion, though progress has been so rapid, we are still a long way from finality. Analyze the requirements of the 1916 buyer. He may not be able to sum up his ideals, but they seem capable of expression in the manner following.

The ideal car should have two pedals and a steering wheel. When power is wanted for starting, for speed, or for hill climbing, press the power pedal; when it is desired to stop, press the retarding pedal.

At all speeds there should be no vibration and no sound.

Over all roads the car should roll without shock at any speed.

Its operation and maintenance should require no mechanical knowledge.

It should cost little to buy, and less to run.

If that is truly the ideal, are we not indeed a very long way from satisfying it utterly?

The automobile of the type we know is a wonderfully perfect machine, like the typewriter or the telephone; but like both it is marvelously imperfect, in that it is an immense distance away from what the human mind is capable of desiring it to be.

May Build Motor Speedway in Canada

Indianapolis, Chicago, New York and the other centers of speedway racing in the United States are to have a rival next year across the Canadian boundary line, as a syndicate of Montreal sportsmen is planning to construct a course there and have it ready for the first meet early in June. A site has been selected by the promoters. It consists of 320 acres of ground and is located five miles from the center of the city in a territory served by the Grand Trunk Railroad and the Montreal and Southern Counties street cars. T. C. Kirby, head of the Montreal Automobile Trade Association, is taking an active part in the promotion of the project and has been made general manager of the Canadian Speedway Co., Ltd., with offices in the King's Hall building.

Good Advertising for the Horse-drawn Vehicle

Manufacturers, jobbers and dealers in carriages, harness and horse goods generally are now offered an exceptional opportunity to push their business through the medium of a handsome art poster.

The cost of such a poster would be prohibitive were it not for the fact that a big organization of carriage manufacturers is sharing a large part of the expense. With the co-operation of this organization the cost is very low indeed to the individual advertiser.

The Vehicle Trade Press Committee of the Carriage Builders' National Association, since the Cleveland convention last September, has had prepared by eminent artists, a handsome poster, done in colors, designed to give favorable publicity to the horse and all his accessories,



such as buggies, harness, whips and other horse equipment.

This poster, a reproduction of which is shown herewith, is 15 x 28 in., and is printed in four colors.

The cut gives but a faint idea of the interest-getting effect of the poster itself. A space is left blank at the bottom for the insertion of the dealer's name or manufacturer's name and address, and such other wording as may be desired.

It is desired that every one interested in the sale of carriages and horse equipment shall have the opportunity to inspect this poster, and a sample, with the special low prices quoted, will be sent manufacturers and dealers who make the request on their business stationery. Address, Vehicle Trade Press Committee, A. M. Ware, chairman, 1010 Arch street, Philadelphia.

Effect of the British Motor Tax

The motor correspondent of the London Times has made some interesting observations on the state of the automobile business in Great Britain in connection with the recent import tax. He writes as follows:

Although the matter is not one for which definite statistics can be given, in the opinion of men qualified to judge the demand for motor cars continues brisk. Second hand cars by reputable makers and in reasonable condition command good prices, and such new cars as are available readily find purchasers. As the makers in this country—and the same is true in France—are devoting most of their energies to purposes other than the production of cars, or if they are making cars these are not available to the ordinary buyer, it follows that the demand can not be satisfied from home sources; and in these circumstances American manufacturers, who are said to have turned out over 600,000 cars during the past 12 months, have been enjoying a golden opportunity.

Evidence of Trade Returns

The import tax of 33 1/3 per cent. to which certain motor vehicles of foreign manufacture have been subjected since the end of September on entering this country has, however, introduced a new factor. In September last, according to the Board of Trade returns, the number of complete cars and chassis imported for sale was 2,661, with a value of \$2,519,771, whereas last month the number fell to 1,806 and the value to \$1,622,515. The figures for last month are far above those for the same month last year, when the number of cars and chassis was 336 and their value \$460,663; but in view of the disturbed conditions existing last autumn perhaps a fairer comparison is with October, 1913, when the number was 1,119 and the value \$1,232,855. In September, 1914, the figures were 197 and \$212,792, and in the same month of 1913 they were 1,156 and \$1,290,454. If the effect of the tax, as indicated by the figures for last month, is not so great as might be expected, it must be remembered that the returns do not distinguish between cars intended for private use, which have to pay the tax, and those for commercial purposes, which do not; and for anything the official figures show the falling off may have been chiefly, if not entirely, in the former category.

In passing it may be noted that the tax appeals to different sections of the motor car trade in very different ways. Manufacturers can regard it with equanimity, at least; and though it can have no immediate effect on firms which are not at the moment making cars for ordinary sale, it may help to secure their position against the time when they are able to start producing again. But to the retailers or agents, through whom in normal times the bulk of the cars made in this country are distributed to the public, the matter presents itself in another light. They rely for much of their livelihood on the profits they receive from selling cars, and if they have no cars to sell those profits naturally disappear.

Character of Motor Traffic

As regards motor car tires and tubes and their accessories, which are exempt from import tax, the figures for the last two months are almost identical, the value being \$1,401,270 in September and \$1,398,992 in October; but the value of "other parts," which are taxed, actually increased from \$705,088 in the former month to \$1,097,989 in the latter. These figures do not suggest any reduction

in the total volume of motoring; and the statistics of the imports of motor spirit, the other chief item besides tires in the running expenses of a car, point to the same conclusion. In September 9,879,103 gallons were imported and duty was paid on 10,766,314 gallons, while last month the quantity imported reached the enormous total of 15,982,832 gallons and duty was paid on 10,251,373 gallons.

Yet apart from the fact that a large proportion of the tires and gasoline used must be debited to commercial vehicles, not all the riding in so-called "pleasure cars" can fairly be classed as luxury. It is true that in the summer an unusually large number of people spend a holiday touring by car in this country instead of going abroad, and that on Saturdays and Sundays particularly the roads have been very full of motor car traffic. But in this case observers whose business it is to live on the roads say that the occupants of the cars were in marked contrast to those seen in normal times; they were evidently hard-worked people who were taking a little relaxation from the exertions of the week. Again, the cars that have become indispensable to many business men are indistinguishable in appearance from luxury cars, yet can not properly be counted with them. The same is true of the cars used by doctors, who by their aid can extend their radius of action to distances that would be impossible with a horse. Many private cars are also engaged on works of mercy, not of luxury, such as conveying wounded soldiers to a hospital or taking convalescents out for drives.

Famine Here, Gasoline to Soar

"An oil famine is not coming, it is here," said oil men in Bayonne connected with the Standard and Tidewater companies recently. They stated that the price of gasoline would continue to soar during the next few months at least, and disputed the figures recently given out at Washington with the announcement that the government was to investigate the increased price of gasoline.

"Washington figures make it appear that the price of gasoline is being advanced in the face of increased supplies of crude petroleum," one oil man said. "But not all crude petroleum yields the same percentage of gasoline."

"No mention is made of the stupendous expansion of the automobile industry, which is almost wholly responsible for the demand which the refiners are unable to meet, nor of the tremendous falling off of the great Cushing Pool in Oklahoma, which has declined from 300,000 barrels a day in May, 1915, to less than 100,000 barrels in December. While the total production in 1915 was in excess of 1914, the production for the last six months shows a falling off of 50,000 barrels a day, as compared with the first six months."

"Where there is increased production it consists almost entirely of crudes which yield only a small percentage of gasoline."

Only 19 Autos Imported in November

Automobile imports for November amounted to \$33,780, and numbered 19 cars, compared with \$81,647 and 62 for the corresponding month in 1914. For the 11 months ending November, automobile imports amounted to \$312,256, and numbered 204, as compared with \$454,733 and 280 cars in the corresponding period in 1914.

Aluminum—The Texture and Composition of This Metal Microscopically Considered

The interest that is being taken in the manufacture of various parts of motors of aluminum or alloys of that metal in place of cast iron, particularly for pistons, cylinders, etc., has drawn increased attention to the composition of the basis of these alloys, which is, of course, pure aluminum. The special pistons and cylinders now being cast in Europe and America are made of a secret alloy, which this article does not propose to touch on, nevertheless the microscopic examination of samples of the pure metal cannot fail to be of interest.

Aluminum is a silver colored metal about one-third the weight of iron, steel, brass, copper, or bronze, and is cheap when compared with the cost of some of the more expensive metals, these facts alone being of great value. Freedom from corrosive effects, cleanliness in appearance, fineness of texture, relative strength and ductility—these and other merits commend it very forcibly to those industries which have given it a fair trial.

Aluminum is never found in a free state in the earth, but is always combined with mineral matter, from which

oxidize or rust, and are gradually eaten away into minute pits, which may completely perforate these metals.

Aluminum can be dissolved in caustic potash and caustic soda, but these chemicals would never be used upon it in the ordinary way. For producing attractive effects, however, they are favored in the factory, as is explained later on.

We hear so much concerning the difficulty experienced in soldering aluminum that it will be advisable to give attention for a few moments to this phase of the subject. The process of soldering implies the temporary formation of an alloy with the metal being treated, and that melted upon it. The flux is intended to dissolve any oxide formation, or prevent its occurrence.

Now, in the case of aluminum extreme heat produces a white coating or film of oxide, due to the combination of oxygen from the flame with some of the metal. It is difficult to find a suitable solvent for this oxide; hence the trouble. Many claims are now made, however, by interested people that a proper flux is procurable. It is not my business to decide upon such matters, but there is no doubt that the old prejudice against the metal on this account is diminishing.

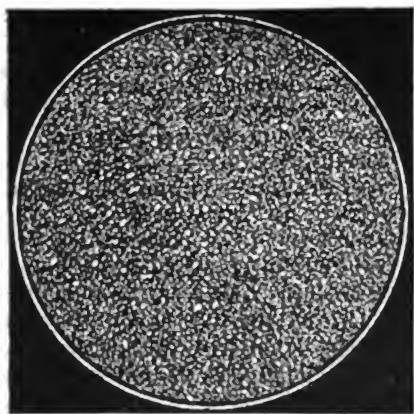


Fig. 1—The texture or structure of aluminum shown greatly magnified. The space is equal to the diameter of a pinhole.

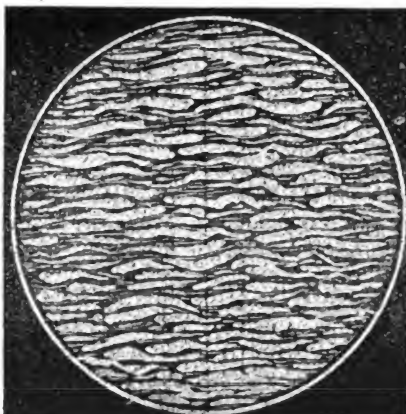


Fig. 2—The satin-like surface of aluminum under the microscope.

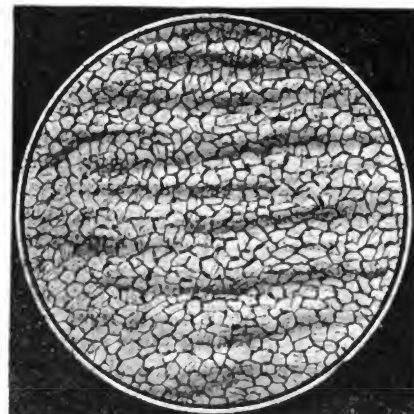


Fig. 3—A greatly magnified space showing a film of oxide formed on aluminum by heat.

it must be extracted. It is the most abundant metal, but it is so well locked up in the compounds containing it as to entail exceptional difficulty in removing it. All kinds of clay, many shales, and silicates, besides minerals such as bauxite and cryolite, contain aluminum.

Clays are compounds of silica and alumina. The first named consists of a hard, glossy substance, of which sand, flint, and quartz are typical varieties; while the alumina, which resembles a sort of white earth, is an oxide of aluminum; i. e., it is composed of oxygen and the metal in association with each other.

Commercially, aluminum is obtained chiefly from its chlorides. White or china clay, which is also called kaolin, is the purest form of aluminum. Brown clays are colored by iron oxide, or rust. Other colors are also due to the presence of metallic purities, into the details of which it is hardly necessary to go. The point I wish to emphasize is that all clays contain the metal, and when the clever methods now practiced are still further improved, so as to be applied to the common materials just named, the metal must become incredibly cheaper.

Aluminum is absolutely free from corrosive influences, whereas iron and steel, when exposed to moisture, rapidly

In regard to welding, the metal presents favorable aspects. Two ends, or edges, upon being suitably heated, preferably by means of the oxy-acetylene flame, are rendered so readily amenable that they can be intimately connected with one another when tightly pressed together. The oxide forms as usual, but is squeezed out as a ridge, which can be easily removed by a skilled workman.

The oxide, or white powdery film, which is engendered upon strongly heating the metal, is chemically the same as pure alumina. It is practically identical with the basic position of white clay.

In my experiments and microscopical observations, Fig. 1 shows its minute structure or texture. This is disclosed when the surface is frosted, as is done by treating it successively with caustic soda and nitric acid. The soda combines with the metal, and is then removed by the acid, which does not otherwise affect it. The details disclosed prove that aluminum is very minutely granular, the tiny particles cohering together very tenaciously, the sparkling being due to contrasts between prominent specks surrounded by dark depressions. If the metal is cut, streaks are formed by pressure.

Elemental metals, such as iron, or treated ones like

steel, reveal a comparatively coarse structure, the steel containing, as a rule, crystals of graphite, which weaken it. Alloys are usually so mixed that particles of the separate metals exist between one another, and thus reduce their efficiency.

This aluminum texture on the surface gives the metal a beautifully white, frosted appearance.

By abrading the surface by means of a fine wire brush, it is ridged up into a series of minute, worm-like figurings of the kind shown in Fig. 2. There also the minute effect is due to elevations and corresponding depths. To the naked eye the metal thus treated is not quite so white as in the preceding case, but is still neat, and is called satiny.

In Fig. 3 is depicted a film of oxide, occasioned by extreme heat. A kind of minute surface bubbling is thus caused, the separate specks melting together, and when this cools the globules subside as a mass of loose semi-crystalline particles, capable of peeling off. They get furrowed collectively, and generally break up into an exceptionally fine white powder, as already mentioned. When this film is dissolved away the metal beneath is in a satisfactory condition like No. 1.—J. Scott, in *Light Car* [London].

Perlman Demountable Rim Patent Decision

The United States Circuit Court of Appeals, Second Circuit, before Lacombe, Coxe and Rogers, circuit judges, Justice Lacombe presiding, has just handed down a decision affirming the decision of Justice Hunt, C. J., in the United States District Court, who declared the Perlman demountable rim patent valid, and infringed by the Standard Welding Co., of Cleveland, O., a concern which makes 12,000 rims daily and has 3,000 employees. An injunction and accounting order against this company was issued last August by the lower court.

The Perlman demountable rim patent case is of more than ordinary interest because it affects the use of demountable rims on nearly all the automobiles made and now in service in this country—about two and a half million of them. Henry Ford is the only automobile manufacturer who does not use demountable rims as a regular and standard equipment, for demountable rims are notably absent on Ford cars when they leave the factory.

About one-third of the Ford product is, however, annually fitted with demountable rims by Ford's agents and dealers, when so ordered by their customers, besides which a whole lot of other Ford cars are also finally equipped with demountable rims by their owners and users.

The Perlman rim decision is one of the most important decisions rendered since the beginning of patent litigation in the automobile industry. The demountable rim is a practical necessity for every car, and thus far there is no substitute for it that does not infringe the Perlman patent.

The Perlman demountable rim patents were applied for in 1906, and the patent was finally granted in the Patent Office, on February 4, 1913. Perlman, however, was not behind these delays, for both he and his attorneys were insistent upon a prompt issue of the patent, because tire and rim makers and automobile manufacturers knew of his invention and had boldly appropriated it, pending the issue of his patent.

Meanwhile, the demountable rim business has grown

in greater proportion than any other part of the automobile industry, by reason of its intrinsic value, usefulness and time-saving advantages.

Good judges of the volume of the output of the automobile industry estimate that of the million cars produced during the current year about 700,000 will use demountable rims. The royalty for the use of these rims, as asked for by Mr. Perlman, will be so moderate that it will not add at all to the retail selling price of automobiles.

Standard Roller Bearing Plans Refinancing

Stockholders and creditors of the company are considering a plan for refinancing the company by which it is proposed to make an assesment of \$730,713 on stockholders and to reduce the debt and capital from \$5,799,835 to \$3,891,758, with further provisions that the holders of notes and other payable accounts are offered the alternative of 60 per cent. of their claims in cash as payment of debts in full or 80 per cent. in the shape of redeemable income certificates covering a period of 20 years. The assesment will be made on the basis of \$15 per share on the first preferred in return for which the stockholders will receive 7 per cent. new preferred and 50 per cent. of the present holdings in new common stock. Second preferred will be assesmed \$7.50 per share in return for which new preferred will be paid in addition to 25 per cent. of holdings in common stock. The assesment also includes stockholders of common stock who will receive 20 per cent. of their holdings in common stock.

Hyatt Organizes Class in Metallography

Employees in the physical testing laboratory of the Hyatt Roller Bearing Co. factories have organized a class in the metallography of iron and steel. The course consists of correspondence lessons prepared by Professor Sanveur, of Harvard, and is supplemented by letters and practical examples taken from the regular shop work. The course consists of two lessons a week and will continue over a period of six months. Tuition is charged for the course, but any employe remaining with the company two years will have his tuition refunded to him. The Hyatt Co. has permitted the use of its metallographic apparatus for the carrying on of the work and prizes will be offered for the greatest progress.

Studebaker Reduces Working Hours

Effective March 1, the regular working hours in the South Bend plant of the Studebaker Corp. will be reduced from 55 to 50 hours a week, divided into nine hours a day for five days, and five hours on Saturday. In order to adjust wages to the new working hours all piece rates and hour rates will be increased 10 per cent. This action affects about 4,000 men and will cost the corporation about \$360,000 per annum. The present pay roll is about \$300,000 a month.

Rubber Club's New Officials

The Rubber Club of America has elected the following officers: President, H. S. Firestone, Firestone Tire & Rubber Co.; first vice-president, Van H. Cartmell, Kelly-Springfield Tire Co.; second vice-president, H. L. Hotchkiss, United States Rubber Co.; and secretary, H. S. Vorhis.

Paint Shop

Yellows in Vehicle Painting

The automobile painter in the small town has, in common with his brother in the larger communities, noted during the season a large number of yellow cars in use, with apparently few restrictions as to variety, a wide latitude being observed in this respect. Perhaps it would be well, says a writer in *Painters' Magazine*, to analyze some of these most largely used yellows. Coffee yellow, for example, is a color that is just now, at any rate, found to be quite a predominating color in both town and city. To the layman this color at a glance may look like a coffee shade, and, in fact it is nearer this than anything else, although it is listed as coffee yellow, which, technically considered, it is. It is produced by mixing flake, arctic, silver, Florence or any of the other finely prepared Japan ground whites, with enough Naples yellow to produce, after adding a few drops of asphaltum to give the mixture proper tone, that peculiar rich coffee shade of yellow which has won for the color the large following it now enjoys. For the smaller class of cars, especially, it brings out an attractive field of color. This is enhanced by striping the color in lines of aluminum, ivory black, dust-proof gray or arctic white. To properly develop the color bring the surface along in the usual way, making all the under coats fine and good. Leave no defects in the surface to mend up and put out of sight after the final coat or coats of color are in place, such work being exceedingly difficult to do upon a color made up of the ingredients composing coffee yellow.

Indeed this is a correct practice in handling all colors, sensitive or otherwise, because at best the repairs made upon the field color are out of place and cannot be surfaced down in connection with the main body of the surface to which they belong. Having established the color solidly on the surface, proceed to bring out the depth of color effects by using two or three coats of varnish color, as the condition of the surface or the quality of the work may indicate. Aim so far as possible to preserve the purity of the color, for which purpose it will be advisable to use some of the color in all but the last coat of rubbing varnish.

Orange chrome yellow, common as this color everywhere appears to be, looks surprisingly attractive flaunted from the sweeping breadth of a big touring car, and this seems to be a plausible reason for its present popularity. It is an easy color to produce, at any rate. Simply bring the surface up, as in the case of any solid color, and apply the yellow, first as a flat color and then as a varnish color, holding some of the color in the varnish up to the last but one of the varnish coats. Lines of aluminum, deep, rich reds or lines of gold or fine lines of pale blue set out orange chrome yellow fields about as nicely as any colors that may be used.

Cream and straw-colored automobiles are likewise much in evidence in some parts of the country, especially in the larger towns and cities. These are rather cool and comfortable-looking colors, with a certain delicacy about them

that appeals strongly to the car owners who wish to get away from the conventional black or blue or maroon.

Cream color, if not bought ready for use, can be made of the following ingredients, approximately: Flake white, five parts; English vermilion, one part; chrome yellow, two parts.

Straw color—Lemon, two parts; flake white, six parts; adding to this mixture a couple of drops of vermilion.

In addition to these are also to be seen canary yellow, primrose yellow, sulphur yellow, and even maroon yellow, that almost indefinable carmine-yellow effect that has a certain charm for anyone seeking a novelty in color. These colors are, so far as the writer is aware, all obtainable ready for use, but in the event of shop-mixing them the following proportions may prove useful:

Canary Yellow—Lemon chrome, two parts; flake white, seven parts.

Primrose Yellow—Flake white, thirty parts; chrome green, one part; lemon yellow, fifteen parts.

Sulphur Yellow—Flake white, and lemon chrome, equal parts.

Maroon Yellow—Chrome yellow, three parts; No. 40 carmine, five parts.

With the exception of maroon yellow these colors are all solid covering pigments, and what will serve for those already described will in like manner do for these. While for the most part striping effects brought out in deep red, aluminum, black and gold, furnish the most satisfying effects, some departure from these may correctly enough be taken. For example, a three-eighth inch line of gold, edged with a fine line of cobalt blue cast correctly on a field of straw or cream color, gives a remarkable pleasing effect. So other little variations may be taken in connection with these delicate-toned yellows to add to their good looks without violating the laws of harmony and contrast.

When brought up from a new surface practically all of these yellows should be started on a field of pure white. Two or three coats of white will serve to furnish a ground solid enough to hold out the yellow in any of the hues here noted. All these colors evince a tendency to darken as they wear and lose some of their original purity. The pure white base acts in the nature of a corrective of this weakness, and it is said to do this by reason of the fact that it offers a neutral rather than a positive base. In other words, it neutralizes the dicoloring effects of the yellow through its own lighter body and the counteracting effect thereof.

In the use of the yellow pigments there is this to be said as an explanation which the inexperienced may well bear in mind, namely, clean processes are necessary from start to finish. The surface must be kept clean at all times and under all circumstances. To accomplish this, clean tools, clean colors, and clean materials and a clean person are essential. In this respect and to this extent these colors cost a little more to apply than some of the darker colors, which are but little, if any, affected by the ordinary processes, which would practically ruin these delicate pig-

ments. They are cooler looking colors in summer, and quite as warm looking colors in winter, compared to the darker colors which the world of fashion has so long worshipped. They offer the painter in the small town and village an opportunity to get away from the conventional shades, tones, and tints without departing from what the automobile using public regard as quite the proper thing.

In this connection there are some other colors closely related to these yellows which are more or less used at the present time, and promise to be used for some time to come. One of these is copper color, which is made of chrome yellow two parts, English vermilion one part, coach black one part. This color, with its peculiar coppery tinge, and with its sheen in the morning sun, when properly applied to the surface, offers something good to look at. After building up a proper ground and matching it as closely as possible to the true copper color, apply a coat of the copper made to dry flat. Follow this with varnish color, using for the first coat three ounces of color in one pound of varnish, first thinning the color partly with turpentine. When dry reduce the gloss by rubbing with a soft wool sponge moistened and dipped in pumice stone flour. Then apply second coat of varnish, rubbing varnish being intended in both cases. In due time give this coat a light rubbing with water and pumice stone flour. For the third coat—speaking now of the best grade of work—use half an ounce of the color in one pound of varnish, as above, and flow on as freely as in the case of clear varnish. Rub as above directed, stripe and ornament, and then apply a coat of pale rubbing varnish. This coat in proper time will only need a moderate rubbing, and should then be finished with a very pale elastic finishing varnish. In the event of finishing with one less coat of material omit the last coat of varnish color mentioned. The finish will still be very good, but probably lack somewhat in depth of coppery effect and brilliancy or sheen. Striping effect in aluminum, gold and black, ivory white, pure white, and in No. 40 carmine, edged with ivory black, furnish fine contrasts and serve when well brought out to show off a car amazingly well.

Another color that has evoked some applause from car owners is chamois. This is made of raw sienna, three parts; lemon chrome, one part; flake white, six parts. Perhaps you can buy this color ready for use, and if so it will be found the most convenient plan and quite as cheap as shop mixing it. It is really a very attractive color, and when the precise color of the chamois skin is produced with appropriate striping effects, the whole gowned with a superb finish, the car displaying it is sure to attract immediate attention. For striping effects Indian or Tuscan red, vermilion, aluminum, gold edged with black, or with No. 40 carmine show handsomely.

Develop this color from a blank white ground, same as the yellows already described, observing all the extra attentions recommended for such colors, and depend on the varnish color to bring out the effects characteristic of the color when rightly produced. Here, however, a word as to the importance of varnish color consistency. The tendency is to use too much color in proportion to the amount of varnish. Always the greatest brilliancy is attained with a limited quantity of color, and when this color field is built up solidly before commencing the use of the varnish color coats there is no possible use of having the material carry an excess of color. This is true of the pale yellows, practically to the same extent that it

is true of the so-called transparent coats, such as, for example, carmine, lakes, ultramarine, etc. The final coat of chamois skin color need contain not to exceed one-half of three-quarters of an ounce of color to a pint of varnish. This will be ample to furnish requisite strength of color, and it will much better serve to bring out the brilliancy of effects which the car users have a right to expect. In finishing over this color the palest varnish it is possible to secure should be used, preferably water white varnish.

As a sort of contrast to the coffee yellow above described coffee brown as a color for some of the heavier class of cars is now attracting a good deal of attention. If not obtained ready for use, mix as follows: Yellow chrome, two parts; burnt sienna, one part; burnt umber, five parts. These are approximate measurements, the varying strength of pigments as put out by the different manufacturers naturally making them so. Take a kernel of well-roasted coffee, and with it as a sample a fairly good colorist will be able to work close up to the color. This brown is about the most effective of all the browns of the deeper shade, and it has a richness that many of them do not have. It is, moreover, a perfectly solid covering pigment, and any ground that will do for other solid colors will do for this. A couple of coats of varnish color will produce the required lustre and depth of effect. Gold and black lines, ivory white and shades of brown either lighter or darker than the field color, yield taking effects. When a customer comes in to discuss browns for his car don't fail to call attention to this color. Neither need you be ashamed to mention chestnut brown to him, for it is a fine color and a most durable one. To make it, use one part of ivory black, two parts of chrome yellow, and two parts of English vermilion. It is a solid color, and with the same attention given other browns it will do perfectly well. Stripe the same as recommended for coffee brown. The somewhat famous twentieth century brown is made of burnt umber toned with a little vermilion and ivory black. It is a deep rich brown, and looks at its best striped in lines of gold and black or ivory white, the white lines being drawn fine.

Like the yellows, the browns wear durably; and while wearing they show pleasing color effects without showing dust or dirt or road accumulations. They are neutral colors as respects the season, being neither hot nor cold. Colors, too, that are easy to clean, as colors go, so that, taking the two families as a whole, they have substantial advantages to recommend them.

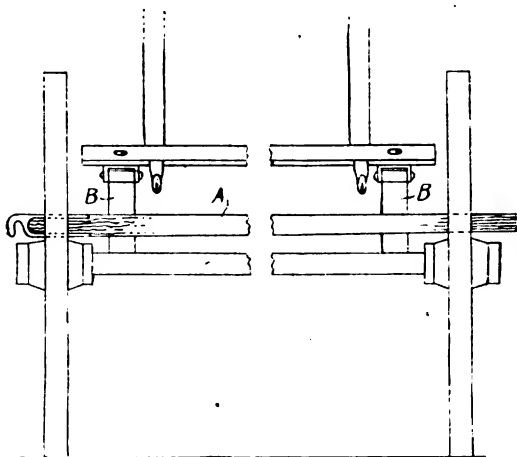
Storing Varnish

Many decorators, even in normal times, follow the practice of buying their varnish and other paint materials in comparatively small lots, as they are required, and never dream of storing any considerable quantity. If first class work is to be done, the keeping in stock of white lead and varnishes, among other materials, is very desirable, as both improve considerably with time, provided that it is not extended over too long a period. The importance of maturing varnishes is so well recognized among large consumers, such as the big railway companies—who, of course, use enormous quantities—that they often purchase the complete contents of tanks holding many hundreds of gallons, and place their seal upon it so that it remains undisturbed until it is wanted for use. It is well recognized among practical men that varnish matures more satisfactorily in air-tight tins than it does in tanks. The

ageing has the effect of causing impurities to settle out. On this subject, James Adams, of the firm of William Harland & Sons, in a paper read as long ago as August, 1889, before the Institute of Carriage Manufacturers, says: "There is no doubt that the leading firms age their varnish before sending out to the consumer. But if it is kept in large tanks, and like wine in bulk, it will not get that fullness of body and roundness of character which, in varnish, should be redundant of lustre and brilliancy, and to which it will attain when carefully stored in tins of convenient size for a length of time. There should be no difficulty in the coach maker always having in his possession a sufficient stock of well-kept best finishing varnish because of its incalculable value. My own experience has taught me that those firms who make a practice of giving a couple of years or more to the age of their best varnishes, invariably have, in their show rooms, the most superior finished work." These remarks apply equally to house painters' work, and should be taken to heart by decorators. McIntosh, in his book, "Oil Varnish Making," quotes Wilson Neil, who says: "I have experimented with varnishes at various periods from the varnish being made, from one month's age to twelve, and have invariably found that the varnish within 15 inches of the surface is more perfect and sooner ready for use than that beneath it, and that the varnish toward the bottom of the cistern requires time and the action of warm weather to cause the moisture, acid and driers, to settle before the varnish is fit to use."—The Decorator.

Wagon Fasteners and Improved Seats

There are many methods in use to prevent the horse from walking away during the time the driver is not on the wagon. In some cases wheels are chained together and in others a chain is connected to the side of the wagon and looped around the rim of the rear wheel. Both methods are satisfactory. But here is another idea, taken from Blacksmith and Wheelwright, which is seen every day in the New York trucking district. The rung or stake is removed from the rear of the truck and placed between the spokes of the two rear wheels. If the horse should

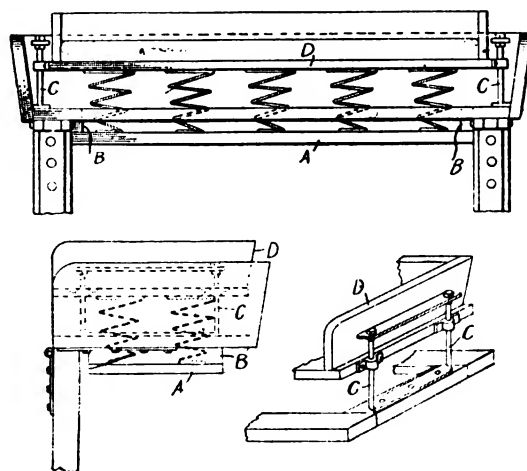


A wagon fastener

walk off or run away, the rung A is forced against the rear springs B, and prevents the wheels from turning, as shown in Fig. 1. This method is just as quickly applied as other methods in use, and just as safe.

The other suggestion illustrated relates to the comfort of the driver. On large trucks they have what they call

a hinged seat, which is fastened to two upright standards at the front of the truck. The reason for this is when the load is too great, the seat is turned over to allow the load to come flush with the front of the truck, or loaded up beyond the seat. Oftentimes the driver makes his seat on the top of the load, but in many cases the driver has the use of the seat at all times, and finds it very uncomfortable in riding, especially over rough country roads and streets paved with cobble stone. The seat shown in Fig. 2 will do away with the constant jarring experienced with the seat of today, and afford greater comfort. The main



An adjustable seat

seat board A is lowered about 2 in., and hung on two cleats, B. At each side of the seat is a guide, C. The additional seat, D, is held in place during the operation of lowering and raising. Ordinary seat springs, E, are fixed to the bottom of the additional seat, and also to the bottom board, A. This will be found to be a comfortable seat with either one or two persons riding.

For Greater Mileage

Many a tire is relegated to the junk heap long before its usefulness is over. Often a repair, an inner lining or a retread, will put a tire in a condition which will permit an increased mileage more than justifying its cost. Time was when the tire repairman took long chances—inadvisable repairs were made—but the dependable vulcanizer today recommends only such work as he believes will make for a saving to the motorist.

Before discarding an old tire it is well to show it to a competent repairman. He will generally be able to ascertain whether the additional mileage expected will warrant the expenditure involved. If a repair is inadvisable, he will not recommend it, for every job of that character means a dissatisfied customer.

A tire that has given good service but has its fabric weakened in places may be reinforced by the application of an inside tire protector.

Opening the Automobile Door Electrically

In many cars it is awkward for the chauffeur to open the automobile door. With this in mind, Thomas A. Porter, of Tuckahoe, N. J., provides a sliding door which is spring closed but can be opened by closing an electric circuit operating in connection with a solenoid which moves an armature connected with one arm of a bell crank lever whose other arm is connected with the door.

Alumni Association Dine

Amid the harmonious strains of soft music, a large representation of graduates of the Technical School for Carriage Draftsmen and Mechanics of New York gathered at the twelfth annual repast and reunion of the Alumni Association of that institution on Friday evening, January 7, at St. Denis Hotel, New York City.

The association is constituted, mainly, of automobile body designers, many of whom hold responsible positions in that capacity, with the largest motor car manufacturers in the country and who came to New York as representatives of their respective houses to attend the recent automobile shows; some are also engaged in the construction of automobile bodies.

The opportunity to meet their old classmates could not be resisted, consequently a large attendance and an enjoyable evening resulted.

The Technical School is conducted under the auspices of the Carriage Builders' National Association at the Mechanics' Institute, 20 West 44th street. The board of trustees are composed of men prominent in the carriage and automobile industries and consists of the following gentlemen: Daniel T. Wilson, chairman; Hon. Franklin Murphy, William W. Ogden, Charles H. Richter, William R. Innis, secretary. Honorary trustees are: Charles Clifton, of the Pierce-Arrow Motor Car Co., Buffalo, N. Y.; Herbert H. Rice, of The Waverly Co., Indianapolis, Ind.

The classes of the school are divided into three divisions as follows: Day, evening, corresponding.

A subject which received considerable attention was announced by the president. It was to the effect that the Instructor-in-chief, Prof. Johnson, will complete this year his twenty-fifth anniversary as teacher. A suggestion was made that the event should be commemorated in a manner fitting the occasion and that manufacturers who have been benefited, indirectly, through the knowledge imparted to the pupils, should take an active interest in the event and assist in making it an occasion long to be remembered.

Some of the alumni spoke in terms of commendation of their alma mater and the dean of the school and of the benefits derived through their course in the school.

Among those who occupied seats at the table were: Andrew F. Johnson, Frederick Kubler, H. Wesley Heite, Carl H. Hamann, Omaire J. Duhamel, Geo. Woodfield, E. M. Galle, J. H. Klein, James A. Fitzsimmons, of Lindsay, Ont.; William Fink, New Haven, Conn.; Geo. V. Rasmussen; Herman F. Maurer, Elizabeth, N. J.; James D. Trehy; August Reipe; John M. Pullar, Bridgeport, Conn.; Geo. L. Tasman; Charles Gerry; Erwin L. Bare, Bridgeport, Conn.; John M. Kelsey; Frank Pocovsky; Erick Wengren; Arvid L. Johnson, and others.

Claims Oldest Carriage Builder

According to a local paper, L. Burg, Sr., recently re-elected president of the L. Burg Carriage Co., of Dallas City, Ill., is the oldest active carriage manufacturer in the United States.

"Mr. Burg," says the paper, "has been in the business for over half a century and in preparation for his life work he served apprenticeships in both blacksmithing and wagon making, thus affording him a foundation for his work that has been of inestimable value since."

"There are many old carriage makers in this country but none can lay as good a claim to seniority as Mr. Burg,

who started in the business when a young man and remained actively engaged in the manufacture of vehicles since.

"At the annual meeting in addition to Mr. Burg being re-elected as president, Homer Lynn Burg was made vice-president, secretary and general manager. The company is enjoying a steady inflow of new business for the coming spring selling campaigns by dealers."

Carriage Maker Successful as Auto Builder

Time and again we hear of some man accomplishing an extraordinary feat in an industry in which he has apparently had a limited amount of experience. Yet if one analyzes the really underlying causes it usually comes to light that in some way or another that man has had a preparation for his work that has stood him in good stead.

Automobile production managers the country over have expressed surprise and amazement at the wonderful efficiency that D. M. Averill, general manager of the Dort Motor Car Co., has developed in the Dort plant during the last nine months. That he should be able to handle the immense amount of detail that is routine in managing an institution the size of the Dort factory—detail that is trebled, because of the comparative newness of the Dort on the market—the Dort now being in its second year and having made good from the very first—is not, however, a surprise by any means to the men that really know Mr. Averill and understand his past experience. For many years Mr. Averill has been general manager of the Durant-Dort Carriage Co., of Flint, Mich., of which the Dort Motor Car Co. is an outgrowth.

His remarkable success as a manager of carriages and farm vehicles in directing a plant, which, when the buggy business was at its height, was the largest in the country, has given Mr. Averill a training and experience in management and production that few men in the industry have today. The fact that Mr. Averill has had such a training detracts none from the credit of his latest achievement in production.

Power Developed in Cannon

Monsieur le Commandant Regnault has calculated the actual horsepower developed during the firing of a projectile by some modern specimens of artillery. The results are truly astounding. In the case of a cannon of moderate size, projecting a projectile weighing 7 kilogrammes with an initial velocity of 500 meters, the deflagration of the explosive lasting about one hundredth of a second, we have, during that time, work done to the extent of 115,000 horsepower. For larger artillery, where the weight of the projectile reaches and surpasses 500 kilogrammes, the initial velocity being 900 meters, we have no less than 25 million horsepower developed during the explosion. These figures give an idea of the formidable efforts which the metal of modern pieces of artillery has to support.

Buggy Man Again in Court

Victor L. Palmer, former treasurer of the Michigan Buggy Co., released January 27 from Ft. Leavenworth prison where he had served a two-year term for violating the postal laws, was returned to Kalamazoo Thursday afternoon, January 28. He was taken into circuit court and placed under \$5,000 bail. Palmer is held on a number of indictments voted by the grand jury three years ago.

Great Is the German Chemist

Give the German chemist the sewage of New York City and he would return annually the milk from 100,000 cows. The same man or one of his kind takes straw and converts it into a simple but substantial food. Lead is converted into bread with the addition of potato flour and nourishing yeast prepared from sulphur and sulphate. Copper is scarce, but the same chemist devises an alloy which is composed chiefly of zinc and answers for the making of cartridges. Aluminum is wanted, but the chemist of Germany takes up and mixes some natural deposits of the earth and forthwith the rescue is completed. The junkheaps contain many different kinds of waste, but these are sifted over and magnesia has been turned out so cheaply that it may completely and successfully compete with aluminum. Nitrate as a fertilizer comes from Chili and due to the blockade it could not be brought in, so the German chemist turns to and discovers a way of converting the nitrogen of the air into the nitrate which the country must have for both the making of explosives and the making of bread. Paper that would go to waste and that does go to waste in other countries, is taken up and turned into industries of a profitable character, all through the same German chemist, who has even succeeded in making, it is said, healthful and palatable food out of the offal that is thrown away in the slaughter houses of this country. And as the German chemist has done, so others may do if they do not now at present achieve the same success. It is a case of sticking to it, calling in the apparently infinitesimal things, putting one and the other together and making a product just what was badly needed.

A chemist is a student, and to be so must be a thinker. He is not disappointed if one failure strikes him, but turns to and looks up another way by which he can attain his success and he stops at nothing until success greets him, but, of course, he proceeds along the lines that are logical and that reach the goal of his thoughts and of his ambition. What a lesson a chemist teaches others of humanity. Some men start in, hoping to achieve in a day, a week or a month that which should not be expected in a year. And we are impatient if we do not get what we want immediately, never for a moment being either considerate or content to wait and work out the salvation which is ours and which we will get if we only work for it.

If we would take a lesson from what the chemist of Germany has done, and no doubt what those of other countries have also done, we would more readily conclude that there is a way out of every intricate task and a condition elevated to that which we now may be occupying, a condition where we would all reach and which we can reach if we are consistent in prosecuting the means which is in our hands if we only think. And to think and think well before employing any hasty means to reach the end, usually spells success. It promises the winning and when the winning is once secured it is there to stay because we have fought and worked and won by the sheer force of will and the use of a mentality which is God given and which sustains us in our every effort.

Offers Twin Six for Oldest Car

The Haynes Automobile Co., Kokomo, Ind., is offering a Haynes Twin Six to the owner of the oldest Haynes automobile in America. The company is desirous of procuring its oldest car now in service. This will be an even

trade. Owners of the old Haynes cars are requested to send in their names to the factory, together with complete descriptions of the cars.

Dray Horse Now Society's Pet

If the whimsical vagaries of the millions who seek surcease from monotonous care in New York had not turned this winter to ice skating, Billy, mongrel horse of the pavements, would not be living as luxuriously as any blue blooded, fast stepping racer in the Biltmore Hotel.

As it is, the fates who preside over the playgrounds of New York must have been in a jocular mood when they willed that the shaggy, ill kempt horse, whose long life had been spent dragging heavy drays about the cobbled streets, should be transported as fast as an electric freight elevator could do it, from a cold, ill ventilated stable to a luxurious, steam-heated room in a great hotel.

And yet, though poor, stupid Billy, amiable but commonplace in temperament and understanding, will never realize it, his long career of learning humility and gentleness was to bring him, for a time at least, to peace and plenty and kind words and caresses. It was necessary to find a horse who was gentle, who would not kick out walls or run away in a hotel corridor, to drag the ice scraping machine over the ice in the Biltmore Ice Gardens, and after a long search Billy was found, attached to a fruit wagon, on the east side.

He was curried and clipped and brought to a room on the second floor of the Biltmore, and from there through a corridor to the ice garden. He did his task well and is now a permanent fixture, with quarters in the hotel and many friends.

The men and women who come to skate and idle and drink tea feed him tidbits and scratch his head or pat his neck, and Billy, clumsy and unused to these caresses, pats his carefully wrapped hoofs on the rugs and swishes a time-bitten tail.

He drags the ice machine carefully, as if realizing his responsibilities, and he goes gently through the corridors and is quiet in his room, never keeping late hours or leaving the light burning.

When the spring comes Billy will go back to the workaday world, a dray and probably a harsh whip and harsher curses, but just now he's living THE life.

\$54,859,000 Spent on Roads

A total of \$54,859,000 was expended by the various states for road building in 1915, according to a circular issued by the Secretary of Agriculture at Washington. In the list of states New York leads with \$15,000,000. California is second with \$7,000,000. Next is Pennsylvania with \$5,000,000. Maryland stands fourth, \$4,572,000. Other states that spent over \$2,000,000 are Ohio, \$3,300,000; Washington, \$3,107,000; Massachusetts, \$2,437,000; Illinois, \$2,100,000.

Improved roads to the extent of 35,477 miles had been completed under state supervision at the beginning of 1915. It was about 20 years ago that state governments began to make appropriations for road improvements; up to January 1, 1915, the grand total set aside by the states for road improvements amounted to \$211,859,000. Showing the way this policy of the states has grown in recent times, the circular states that \$104,000,000 of the total was appropriated by the states since the beginning of 1914.

Ohio in the Horse World

One of the most satisfying reports on the condition of horse industry at present compared with former years is presented by a statement recently issued by State Auditor Donahey, of Ohio.

The statement in question shows that the number of horses recorded by the District Assessors, who covered the entire state of Ohio, was 891,240 in 1915, against 907,127 in 1914, a decrease of 15,887 for the year. During the same period an increase in the number of mules, amounting to 2,328, is shown. The number of mules recorded by the assessors for the last year was 36,581.

The statement systematically covers each county of Ohio and while the figures may not be absolutely correct, they are, nevertheless, the very best obtainable and, therefore, must be accepted on at least an equal basis with those published by the U. S. Department of Agriculture. The latter in Year Book for 1914, closing December 31, gives the number of horses in Ohio as 910,000, an increase of 9,000 over that of the previous year. 24,000 mules is the number credited to the state during each period, 1914-1915. Thus it would show that the assessors employed by the commonwealth used every care in obtaining nearly exact figures.

In some counties it is shown that the number of horses have increased during the past year as, for instance, Clermont, which is credited with owning 8,428 against 8,343 for 1914; Clinton, with 11,242 against 10,619; Crawford, 9,605 against 9,391. Darke, Erie, Fulton, Geauga, Green, Hancock and many other counties that contain none of the large cities, all show an improvement during the last year over 1914.

Coming to the counties in which the larger cities are located a falling off is seen in nearly all of these. Cuyahoga (Cleveland) had 23,489 in 1914 against 15,702 in 1915, this county showing the largest decrease of any in which the great cities of the state are located. Hamilton (Cincinnati) had 15,791 assessed for in 1914 against 14,893 last year, a falling off of less than 1,000 head. Montgomery (Dayton) at the time the statement was compiled, had 16,888 head against 17,237 the year previous. Lucas (Toledo) is one rare exception to the big city rule, for it has credited 10,854 head of horses in 1915 against 6,683 in 1914.

The counties in which medium sized cities are located do not show up as well as those in which the smaller towns are, for instance, Ashtabula (Ashtabula) is reported to have 12,830 head of horses in 1914 and now is charged with only 9,936. Columbiana, which contains East Liverpool, fell off during the last term from 11,298 to 10,831. Tuscarawas lost but 17 horses, according to the report, during the last year, they having 10,786 in 1914 and 10,769 now. Sandusky, in 1914, had 10,381, and now has 9,633. Licking, in which Newark is located, had 15,572 and now has but 14,875 horses. The total number, as stated before, of horses in the entire commonwealth, is 891,240 against 907,127 in 1914, a falling off of 15,887 for the year. To which reference this important explanation should be made: When in 1914 the state assessors went over the ground they found that the number of horses in the state had increased 90,957 over the previous year, so that compared with 1913 there is still some 75,000 head more in the state now than there were then. Such is the summary of Auditor Donahey.

Automobile Repair Prices

The following estimated prices are for the labor and not for the material. It is a good list for automobile repair men and is taken from Newsabout Fords:

Overhaul—

Motor and transmission.....	\$18.00
Motor only (or motor transmission out of car)...	14.50
Transmission	11.00

Repair—

Burned out bearing.....	10.50
Main bearing knock.....	8.50
Put in two or more pistons.....	6.00
Cylinder knock	5.00
Put in two or more connecting rods or repair oil leak	5.00
Put in one new piston.....	5.00
Leak in crank case.....	5.00
Put in one connecting rod.....	3.75
Grind valves, clean carbon.....	2.75
Change transmission bands.....	2.50
Rebore and rebabbit cylinder block including fittings of pistons.....	3.00
Rebore cylinder block only.....	2.00
Tighten transmission gasket cover on case, or rebush transmission	2.50
Cylinder head bolts (stripped).....	2.50
Replace crank shaft starting pin.....	1.50
Cylinder front cover.....	2.00
Overhaul carbureter	2.00
Braze crank case arm only.....	1.50
Change cylinder head gasket.....	1.25
Tighten motor to frame.....	1.25
Commutator wire loom and brush.....	1.00
Assembly fly wheel only.....	1.00
Change carbureter .....	.75
Leaky door or clean crankcase.....	.60
Change pulley fan assembly.....	.60
Commutator pull rod ball joint.....	.50
Leaky carbureter	1.00
Overhaul rear axle or install new housing.....	6.00
Change rear radius rod.....	1.50
Replace—	
Rear spring, tie bolt or new leaf, including graphiting leaves and line up body rear spring tie bolt only	3.00
Rear spring tie bolt only.....	1.50
Rear axle assembly.....	3.00
Repair—	
Rebush system	3.00
Install universal joint.....	2.50
Shaft straighten	1.50
Dope leak, one side.....	1.00
Install brake shoes, each.....	1.00
Equalize emergency brakes and fit brake shoes, or repair hand brake lever quadrant.....	1.25
Emergency brake only.....	.75
Tighten universal joint.....	.60
Or change truss rods, each.....	.60
Or change brake rod supports, each.....	.60
Install or tighten rear spring retainer clip.....	.60
Rebush front axle.....	5.00
Repair—	
Rebush spindles (each side, \$1.50).....	3.00
Broken off radius rod ball cap stud.....	2.50
Straighten front axle.....	2.50
Front spring tie bolt—or new leaf, including polishing and graphiting leaves.....	2.00
Front spring or tie bolt—replace only.....	1.00
Tighten ball cap or replace radius rod.....	.60

The Perfection Tire & Motor Co., Ltd., Hamilton, Ont., has been incorporated with a capital stock of \$1,000,000 by Charles F. Cole, president of the Champion Auto Equipment Co., Chicago, Ill.; Larkin A. Rockwell, Elwood A. Stickelman, and others, all of Chicago, to manufacture automobiles, tires, etc.

Useful Bodies

That May Be Made and Attached to An Automobile Chassis

Herewith are illustrated two commercial car bodies that possibly may be built by the average wheelwright. Fig. 1 is a platform body giving access to the load from either side. A tarpaulin may easily be thrown over the load if desired. The main sides are mortised into the hind bar, while the front bar of the platform is framed on top. The flooring is $\frac{7}{8}$ in. stuff, rabbeted on underneath. Substantial plates are screwed on at each corner and a $2 \times \frac{1}{4}$ in. wearing plate on top. There is a small front end bored 15 in. deep, which is bolted right through. This takes the wear off the back panel of the cab and keeps the load on

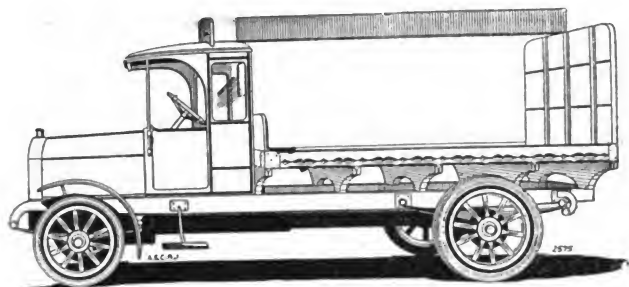


Fig. 1—Useful open body

the platform, where it overhangs the width of the cab. The hind end board is 4 ft. 6 in. deep, strengthened by three battens on the inside, and is fastened to the main sides by substantial corner plates running along the top of the main sides and up the hind board. It is also bolted to the back of the hind bar, which is recessed the thickness of the hind board. A name board $9\frac{1}{2}$ in. deep and 10 ft. 8 in. long, helps to support the hind board. There is also a transverse name board running across the canopy.

The main sides are 6×2 in., and the platform measures overall 6 ft. 10 in. by 11 ft. 6 in. The wheelbase of the chassis is 13 ft. 6 in., of which 11 ft. 3 in. is behind the

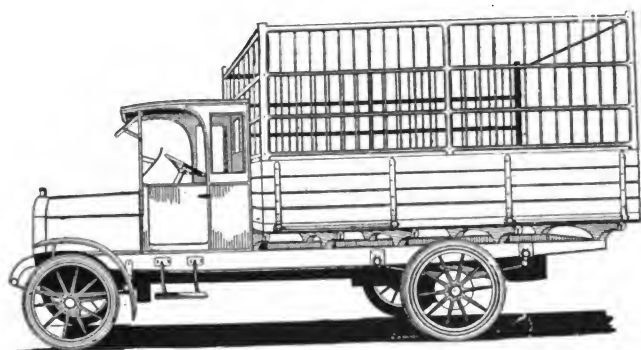


Fig. 2—Garden truck body

dashboard. The wheels are 32 and 36, respectively; the chassis is 2 ft. $10\frac{1}{2}$ in. off the ground. The frame is 3 ft. 4 in. wide.

Fig. 2 is a body that may be used for farm truck. The sides are hinged. Length overall of body from dash, 16 ft. $2\frac{1}{2}$ in.; behind driving seat, 12 ft. 2 in.; width outside, 5 ft. 10 in.; height of hinged sides, 2 ft. $4\frac{1}{2}$ in.; over ladders, 6 ft. $9\frac{1}{2}$ in. Dash to front of driving seat, 26 in.; driving seat, 17 in. wide. The bottom sides are $4\frac{1}{4} \times 2\frac{3}{4}$ in.; front and hind bars, $4 \times 3\frac{3}{4}$ in. The plank sides are 2 in. thick. The uprights of the ladders are $3 \times 1\frac{1}{2}$ in.,

the horizontal rails being $1\frac{1}{2}$ in. square, and pierced with $\frac{7}{16}$ in. round iron spaced about 6 in. apart. The body is mounted on five bearers, $7 \times 2\frac{1}{2}$ in. The wheelbase of the chassis is 12 ft. 6 in., of which 10 ft. $1\frac{1}{2}$ is behind the dashboard; the height of the wheels is 3 ft. and 3 ft. 2 in. respectively; while the frame is 3 ft. off the ground. The frame is 3 ft. 2 in. wide.

Teaching That Should Be "Scrapped"

Present interest in the development of efficiency in technical schools, with a view to making the courses thoroughly modern, practical and immediately serviceable, recalls conditions not so admirable, which prevail in many manual training departments of the ordinary high school. General criticism cannot be applied, as the methods in vogue differ from city to city. There is, however, ground for the belief that a training which is designed to make the student more valuable as a handicraftsman succeeds only in giving him a vague and unreliable smattering of information on half a dozen topics. For instance, a boy is given a few score hours of desultory training in carpentry and woodturning. He constructs a grandfather clock, a tabouret, and a napkin ring. A little later, he is permitted to make "patterns" and to cast them—with plaster of paris, ramming the molds by hand! Forging is taught by the aid of mall hand forges and blacksmiths' anvils. The whole course is buttered with a little mechanical drawing. In the light of modern manufacturing methods, such as confront a young man when he takes up an industrial career, the whole affair seems a waste of time. It might be a help to a future "desk man," who will some day make a wife's heart glad by nailing up a shelf without accident; but a hindrance to him who seeks knowledge of manufacturing processes as they exist today, not as they were yesterday. Such "manual training" is obsolete.—Iron Trade Review (Cleveland).

Less Than Two Per Cent.

Less than two per cent. of the entire number of horses and mules owned in the United States have been exported to the warring countries of Europe.

It is estimated that there has gone abroad for army service 400,000 horses, their weights ranging from 1,000 to 1,500 pounds. Observers view conditions of the horse industry as the most promising in its history. The increased cost of land, labor and other things used in horse raising has gradually widened the gap between the price of good horses and mules and those of the inferior animals until now only the superior animals can be produced profitably, but with these for sale, the horse owner will receive about his own price.

Business Steadily Increasing

More orders for wagons have been received from southern territory by the Owensboro Wagon Co. during the last several weeks than had been received previously since the war knocked the bottom out of southern business, according to Robert Brodie, general manager of the company. If business keeps coming, it is stated, at the present rate, it will shortly be necessary to increase the working force at the plant. Mr. Brodie stated that he was not in position to estimate the volume of business the company might do, but that there was every indication of a steady increase from now on.

Will Welcome a Tariff Commission

Concerning the announcement contained in President Wilson's letter to Claude Kitchin, majority leader of the House of Representatives, John H. Fahey, president of the Chamber of Commerce of the United States, says:

"The statement of the President's position concerning the need of establishing an absolutely independent non-partisan tariff commission will be received with great satisfaction by the business men of the United States. The sentiment of business men in favor of such a commission has been almost unanimous for years, because of the general disturbance of business which has usually attended the making of our tariffs under the system which has prevailed until now.

"At its first annual meeting the National Chamber went on record for the establishment of such a commission without a dissenting vote and to insure the fullest possible consideration of the project by all the organizations in its membership this was followed soon after by a referendum to all the members. The result of this was a vote of 715 to 9 in support of the commission idea. At each succeeding annual meeting the proposal of a commission has been endorsed and on each occasion without a single dissenting vote.

"The National Chamber has meanwhile persistently agitated for this reform and within the last year continued its efforts with renewed energy. In recent months the commission plan has also been endorsed by the more prominent agricultural organizations and by the American Federation of Labor, and the Tariff Commission League has likewise lent its aid in advocating action. This general consensus of opinion representing all of the great economic interests of the country surely warrants the action on the part of Congress which the President has now so emphatically recommended in his letters to Congressman Kitchin.

"The sooner Congress can pass a carefully drawn measure along the lines of the President's suggestions the better the business men of the country will like it. What the commercial interests and all other interests in the country want most to aid them in the promotion of national progress is stability of conditions. While they do not regard a tariff commission as a cure-all by any manner of means, they certainly consider it as a piece of machinery much needed and one that will be a powerful influence for good in our future development. It is to be hoped that the commission will be given adequate powers, that its permanency will be assured and that the necessary industrial facts which it can bring out will be put before the country and Congress so plainly that they will be understood by all classes of citizens."

Wagon Prices Advance

Owing to the continuous advance in material of every description entering into the construction of farm wagons, ranging from \$3 to \$4.50 per wagon, the Turnbull Wagon Co., Defiance, O., has put a 5 per cent. advance into effect, and at the expiration of 90 days a further advance will be made. The company has also discontinued selling on long terms heretofore extended to the trade.

A. J. Colt, general manager, states that he expects to lose some business, but not with the class of customers who are informed upon this subject. He contends that in order to bring about a better condition in the wagon

business someone must take the initiative. Wagons for a long time have been sold on a very small margin and Mr. Colt says it simply would be suicide to continue as heretofore in view of the increased cost of materials.

What Is Steel?

The leading paper of a town of 60,000 came out one day with a front page article telling of the discovery of a steel mine. Probably but one in a hundred would crack a smile at that, so for the benefit of the 99 let us state that steel, by its very definition, is a manufactured product.

The source of steel is iron ore, which may be considered as iron which has oxidized or rusted through long contact with air, moisture, etc. This ore is smelted in a blast furnace, the charge consisting of alternate layers of ore, coke and limestone, and the process is continuous, charging at the top and tapping or drawing off from the bottom.

Briefly, the coke supplies the necessary heat, and also breaks up the ore into its component parts, iron and oxygen. The oxygen unites with the coke and passes off as a gas. The iron melts and flows down to the bottom of the furnace, and is drawn.

Both the ore and the coke contain impurities. Some of these unite with the melted iron, and the rest unite with the limestone, forming a light slag, which floats on the melted iron and is drawn off separately. The metal from the blast furnace is called pig iron. When pig iron is melted in a cupola and cast again in some finished form (casting) it is called cast iron.

When it is put into a steel furnace, of which there are various kinds, and treated so that the impurities which were picked up in the blast furnace are partly, and sometimes almost entirely, eliminated, the resulting product is steel, and it is called crucible, open-hearth, Bessemer, etc., according to the kind of furnace it was made in.

The line between steel and cast iron is difficult to place, but is usually decided by these three factors: Kind of furnace used (whether cupola, open-hearth, etc.), amount of carbon present (the dividing line usually placed at 2 or 2.2 per cent.), and by the malleability, steel being malleable while cast iron is not.

Steel owes its properties to the impurities which it contains, and for that reason they should be called alloying elements instead of impurities. If the distinctive properties of a steel are due to any one or more elements, the steel takes its name accordingly; for example, carbon steel, chrome vanadium steel, etc. Each element or combination has its own distinctive effect on the steel; for example, high sulphur makes it hot short (brittle when hot); high phosphorus makes it cold short; high carbon makes it strong, but brittle, and also makes possible tempering or heat treatment; high manganese makes it non-magnetic; high tungsten, together with chromium, makes it permanently magnetic, once it is magnetized.

Chromium and vanadium together enable us to get greater strength, with less brittleness, than would be possible with carbon only. Some of these alloying elements are present in the steel naturally and others are added while the steel is molten, either in the furnace or the ladle. From this it can be seen that a steel which would be good for one purpose might be useless for another—you couldn't use razor steel for nails, because the first blow of the hammer would break it.

The idea, then, is to find out what kind of steel you want, and get it.—Hyatt Quiet Type.

"Live" Exhibition at San Diego

Motor transportation will come into its own at the Panama-California International Exposition. There will be no automobile show—that is as automobile shows have been known in the past; there will be no automobile exhibits, as such; there will be no medals or awards; but the automobile will be one of the biggest headlines ever presented at any exposition.

Automobiles, both pleasure and commercial, will provide a series of spectacular special events continuing from the opening day to the last day of the year, 1916. Uncle Sam will have men on the ground during the year to collect data on the efficiency of motors to be used in the aviation service, on cars suitable for the work of the artillery, of machines adapted to scout duty, and for the endless tasks that fall to the caterpillar and tractors as shown in the world's greatest war.

This automobile demonstration giving opportunity to every American car will not have a single "still exhibit."

The motor transportation area is practically in the center of the exposition grounds. Surrounding the demonstration field of ten acres are the arcades which will house the machines from the weather. A natural ravine stands within the enclosure in which climbing and equilibrium tests will be conducted in a spectacular manner. Tugs of war, head-on collisions, slow races, tire-changing contests, gasoline tests, and every conceivable means of demonstrating the superior qualities of a car will be given.

Among other events will be special periods given to the demonstration of cars within certain price limits. During such a period all cars less than \$750 will be entered, another demonstration will be offered by cars from \$600 to \$1,200, and to a group including the highest priced cars made. There will be roadster days, touring car days, truck days and each will be designated far enough ahead so that the dealer or prospective purchaser can be on hand to witness a demonstration in which he is especially interested.

Special days for certain cars will not be overlooked and at such times parades and special programs will be offered, giving full sway to one make of car.

Blythe H. Henderson, chief of transportation at the San Francisco exposition, will be in charge of this new idea in automobile display, and W. E. Benton, who had charge of the automobile exhibits installation at San Francisco, will be Henderson's assistant chief.

Instead of barring the automobile from the exposition grounds they will be admitted at all times and at the nominal charge of 25 cents. This charge also includes the right to park a machine 24 hours on the automobile field.

To Make 3,000,000 Wheels in 1916

There were made at the Jackson, Mich., plant of the Hayes Wheel Co. during 1915 a total of 1,723,490 wheels, or more than twice as many as in 1914 and more than five times as many wheels as in 1913. There were on the average 1,000 men on the company's payroll during the year, but at times the number of shop workers was close to 1,400.

The company expects that its estimate of 3,000,000 wheels for 1916 will be below the actual output when the year ends. The production has been remarkably rapid. In 1909 only 81,416 wheels were made at the plant; in

1910 the total was 145,660; in 1911 it was 299,576; in 1912, 322,599; in 1913, production was 333,523; in 1914 the total was 844,609. The total production during those seven years was thus 3,750,872 wheels, or at the rate of four wheels to an automobile, wheels for 937,718 automobiles.

Besides its main plant in Jackson, the Hayes company operates a large plant in Anderson, Ind., and has its hub factory in Albion, Mich. These plants employ several hundred men.

The Way to Glue

For glue to be properly effective it requires to penetrate the pores of the wood, and the more a body of glue penetrates the wood, the more substantial the joint will remain. Glues that take the longest to dry are to be preferred to those that dry quickly, the slow-drying being always the strongest, other things being equal. For general use, no method gives such good results as the following:

Break the glue up small, put it into an iron kettle, cover the glue with water, and allow it to soak twelve hours. After soaking, boil it until done. Then pour into an airtight box, leave the cover off until cold, then cover up tight. As glue is required, cut out a portion and melt in the usual way. Expose no more of the made glue to the atmosphere for any length of time than is necessary, as the atmosphere is very destructive to made glue. Never heat made glue in a pot that is subject to the direct heat of the fire or of a lamp. All such methods of heating glue cannot be condemned in terms too severe.

Do not use thick glue for joints or veneering. In all cases work it well into the wood, in a similar manner to what painters do with paint. Glue both surfaces of your work, except in cases of veneering. Never glue hot wood, as the hot wood will absorb the water in the glue too suddenly and leave only a very little residue.

New Law Affecting Vehicles

Wisconsin carriage manufacturers have just discovered that a law enacted by the legislature last winter, and effective January 1, requires them to tag their upholstery. It also applies to other manufacturers doing business in Wisconsin, for a Wisconsin dealer is subject to fine if he sells a job not properly tagged. The law applies specifically to furniture and automobiles, but it includes "any other article or thing whatsoever," which, of course, takes in buggies, carriages, sleighs, etc. Following is the text of the law:

Section 1418s—3m. Any person upholstering or reupholstering any furniture, automobile of box-spring, or any other article or thing whatsoever, or who manufactures for sale, offers for sale, sells or delivers or who has in his possession with intent to sell or deliver, any goods or articles of any kind containing upholstery, without a brand or label as provided in subsection 3n of this section, or who removes, conceals or defaces the brand or label thereon, shall be deemed guilty of a misdemeanor and upon conviction thereof shall be punished by a fine of not less than twenty-five dollars nor more than five hundred dollars, or by imprisonment in the county jail not to exceed six months, or by both such fine and imprisonment.

3n. The brand or label provided in subsection 3m of this section shall contain, in plain print in the English language, a statement of the kind of materials used in the filling and in the covering of such upholstery or reupholstery, to be specified in true terms according to the grades of filling and coverings used by upholsterers or reupholsterers, whether such materials are, in whole or in

part, new or second hand, the qualities of the materials used, and whether the materials used, if second hand, have been thoroughly cleaned and disinfected. Such brand or label shall be in the shape of a paper or cloth tag to be securely fastened to each article upholstered or reupholstered.

Automobile and Truck Registration

Following is the standing of the states in automobile and motor truck registration after all duplicate registrations have been eliminated:

State	Pop. 1910 Census	Cars and Trucks	Pop. Per Car
Iowa	2,220,681	139,808	16
California	2,893,465	163,801	18
Nebraska	1,264,999	59,140	21
South Dakota	689,277	29,336	23
Kansas	1,818,383	74,956	24
Minnesota	2,263,182	91,829	25
Michigan	3,035,148	114,845	26
Ohio	5,119,491	179,767	28
Indiana	2,807,480	96,915	29
North Dakota	726,142	24,678	29
Montana	452,774	14,520	31
Wisconsin	2,486,941	81,371	31
Connecticut	1,234,031	38,950	32
Vermont	363,075	11,499	32
Illinois	6,110,888	182,290	33
Arizona	251,422	7,320	34
District of Columbia	361,330	10,200	35
Oregon	822,615	23,758	35
Colorado	948,930	26,611	36
Rhode Island	608,540	16,362	37
Maine	770,064	18,600	41
Massachusetts	3,690,748	89,133	41
New Hampshire	441,545	10,819	41
Washington	1,502,632	36,905	41
Delaware	212,489	4,924	43
New Jersey	2,914,928	67,556	43
Missouri	3,401,241	76,462	44
Wyoming	176,853	3,976	45
Nevada	104,732	2,177	48
New York	10,179,971	212,844	48
Maryland	1,357,374	27,638	49
Texas	4,386,638	90,000	49
Utah	429,191	7,994	54
Pennsylvania	8,543,004	150,729	56
Idaho	420,291	7,093	59
Florida	882,148	13,123	67
New Mexico	403,600	4,947	82
Oklahoma	2,158,194	25,615	84
Tennessee	2,279,691	27,266	84
Virginia	2,181,516	21,357	102
West Virginia	1,372,756	13,256	103
South Carolina	1,616,610	14,500	111
North Carolina	2,386,916	21,160	113
Georgia	2,836,177	24,059	117
Kentucky	2,372,412	19,500	121
Louisiana	1,815,218	10,880	167
Alabama	2,316,943	13,798	168
Mississippi	1,939,226	11,500	168
Arkansas	1,726,413	8,021	215
Total	101,208,315	2,423,788	...
Average for U. S.			42

A number of changes have taken place in the standing of states, New York continuing to lead and Illinois keeping second place. California yielding third place to Ohio, has dropped into fourth place. Pennsylvania is still fifth and Iowa sixth, but Michigan has jumped into sixth place, in place of Massachusetts, which now stands eleventh. These states constitute the 100,000 class.

In the states having between 50,000 and 100,000 cars and

trucks Indiana leads, having passed Minnesota. The following table gives the states in the order of their standing:

New York	212,844	Virginia	21,357
Illinois	182,290	North Carolina	21,160
Ohio	179,767	Kentucky	19,500
California	163,801	Maine	18,600
Pennsylvania	150,729	Rhode Island	16,362
Iowa	139,808	Montana	14,520
Michigan	114,845	South Carolina	14,500
Indiana	96,915	Alabama	13,798
Minnesota	91,829	West Virginia	13,256
Texas	90,000	Florida	13,123
Massachusetts	89,133	Mississippi	11,500
Wisconsin	81,371	Vermont	11,499
Missouri	76,462	Louisiana	10,880
Kansas	74,956	New Hampshire	10,819
New Jersey	67,556	Dist. of Columbia	10,200
Nebraska	59,140	Arkansas	8,021
Connecticut	38,950	Utah	7,994
Washington	36,950	Arizona	7,320
South Dakota	29,336	Idaho	7,093
Maryland	27,638	New Mexico	4,947
Tennessee	27,266	Delaware	4,924
Colorado	26,611	Wyoming	3,976
Oklahoma	25,615	Nevada	2,177
North Dakota	24,678		
Georgia	24,059	Total	2,423,788
Oregon	23,758		

Machinery Hall for New York

There is to be established a permanent exhibition of machinery in operation for demonstration and metropolitan trade center styled Machinery Hall, located on the fifth floor of the Grand Central Palace, New York City. Besides housing the automobile show and other New York annual exhibitions the Grand Central Palace is the home of the New York Furniture Exchange which occupies seven floors and was founded 20 years ago in the old Grand Central Palace.

Spaces will be subdivided to suit the requirements of exhibitors in an area of 55,000 square feet. Exhibitors will be enabled to have their offices there with electric lighting and all needed facilities and an efficient force in attendance to cover exhibitors' spaces during their temporary absence, to hand out literature and otherwise, so far as may be practicable, to represent them.

Besides the permanent exhibition it is proposed to hold an annual American machinery exposition in which the permanent exhibitors in Machinery Hall will have the advantage over others in being already in the building.

A permanent publicity bureau will be maintained for both expositions and will efficiently serve both trade journals and daily newspapers. Special efforts will be made by the management to aid manufacturers in extending their foreign business as well as domestic.

Automobiles in Canada

The number of automobiles in use in Canada up to the end of 1915 was approximately 83,128, as against 61,000 in the previous year. The sales are growing rapidly and there is no reason why in a short time there should not be twice as many cars in use as at present. Automobile dealers in Canada state that the outlook for business in 1916 is unusually bright.

It is expected there will be a heavy sale in country districts, as there is a growing interest in automobiles among the farmers, sales to whom during 1915 greatly exceeded those of any previous year.

Auto Shipments Break All Records

Every record for a single month's shipment of automobiles in America was broken in the month of January, according to the report of J. S. Marvin, head of the traffic department of the National Automobile Chamber of Commerce, for the month of January. The total number of freight cars used by the automobile manufacturers was 18,504.

The new record figures show the first month of the year to have been the largest month in motor car production ever known, and when it is taken into consideration that January in the past has been a comparatively quiet month, it may be seen that the chances of 1916 being a record year under anywhere near favorable circumstances are exceedingly bright.

Notwithstanding the congested railroad conditions and the shortage of cars the manufacturers were able to ship with satisfactory results. The railroads and the manufacturers co-operated to a greater degree than ever and an extra effort was made to supervise the use of special cars for automobile shipments. Conditions were adverse at all times. Special representatives of the N. A. C. C. and officials of the organization traveled through the south, New England and the west to see that every railroad in the country was on the alert to give automobile equipment proper handling, this enabling the handling of the immense volume of business. Hundreds of automobile cars were located in this way and turned into manufacturing territories. Dealers in all parts of the country were urged to unload cars promptly and were told that this would enable shipments in the future.

The traffic department of the N. A. C. C., which is in daily touch with the railroads throughout the country, on movement of these automobile cars, has given the matter important attention during the last few weeks and Mr. Marvin took up his headquarters in Detroit, spending practically all of his time in Detroit and vicinity. Frequent meetings of the members of the association have been held.

In spite of the record shipment Mr. Marvin said that many of the big producers of cars would have done better if the assembling of machines had not been necessarily curtailed to a considerable extent to adjust the output to transportation facilities.

The 10,000 new automobile cars which have been delayed in manufacturing through the difficulty of getting steel wheels and other material, are expected to make their appearance in the very near future, but even with this additional supply the output is likely to increase and even then exceed the supply of freight cars.

Predict Lower Output for 1916

In the face of the optimistic report made a few months ago, there may not be as many automobiles manufactured in 1916 as there were in 1915. Alfred Reeves, general manager of the National Automobile Chamber of Commerce, estimated some time ago 1,350,000 as about the correct figure for 1916. Prominent men of the automobile trade who have made thorough investigations of the material and machinery market say that it will be impossible to manufacture any more cars during 1916 than were made in 1915, and that the number may be even less. European demands in the raw material market are such as to make it impossible to obtain some kinds of raw

material in any increased quantities, and the prices are away up. The machinery market is the most difficult situation of all. Some of the leading concerns will undoubtedly produce more automobiles during 1916 than in 1915. There are concerns which had the foresight to cover themselves on material and machinery a year ago.

Meeting of Wagon Department, N. I. V. A.

A meeting of the farm wagon department of the National Implement and Vehicle Association was held in Chicago, February 2. A number of subjects of interest to the manufacturers were considered. The most important, of course, was the big increase in the cost of materials. It was stated that almost every item of material, especially in the metal line, entering into the construction of farm wagons had been advanced heavily. How this situation is to be met is an important problem.

The committee on farm truck standardization made a report which showed that many desirable results would follow standardization, but that there were inherent difficulties to be overcome. The proposition is the same as was faced in the movement to standardize farm wagons. Variety means increased manufacturing cost, larger stocks for the dealer to carry and increased prices to the consumer.

Aluminum Shortage

The rapidly diminishing supply of aluminum caused the Manitowoc (Wis.) foundry of the Aluminum Castings Co. to close down its plant for several days to await the arrival of new stocks of raw material. The Manitowoc foundry, like all divisions of the Aluminum Castings Co., has been working at full speed for several months to fill orders, principally for motor castings and parts. The supply of raw material has gradually been diminishing and the available supply advancing sharply in price. The company is assured of ample stocks for its requirements, but has met with some difficulty in getting prompt deliveries. The delay caused by the temporary cessation of work has been made up and deliveries of castings are going forward according to schedule.

Tire Sizes Much Simplified

Before the movement to bring about standardization of tires was inaugurated, some of the tire manufacturers made as many as 51 different sizes of pneumatic tires. Tires cost more than now and the large number of sizes was largely the cause of this greater cost, since it required a very large investment in factory equipment. The 51 sizes have now been reduced to nine standard sizes and nine over-size profiles. These are based on a study of carrying capacities of tires and fit satisfactorily every requirement. Individual tastes, which formerly were regarded, frequently led to over-burdened and short-lived tires.

Traffic Court for New York

Mayor Mitchell has suggested the establishment of a traffic court in New York. The idea would be to assign all traffic cases, or as many of them as could be brought to one place for trial, to a single magistrate. The mayor thinks the present traffic difficulties would be greatly lessened if all cases were tried by one man who would come to know traffic conditions thoroughly.

Doubling Ford Plant

Overshadowing in importance all plans recently made public involving additions to Detroit's industries was the announcement made January 17 by the Ford Motor Co. that it will practically double the capacity of its already enormous plant during the year.

The erection of duplicates of most of the present buildings is part of the plan, while many of the structures of the present factory will be considerably extended. New buildings and additions will cost probably more than \$2,000,000, and for new machinery, tools and equipment in general, an expenditure of from \$6,000,000 to \$8,000,000 is expected.

A working force of at least 60,000 men, and very likely 75,000 will be on the company's payroll when the revised and modernized Ford plant is in full operation. An output of not less than 1,000,000 Ford cars annually and more likely 1,500,000, will, according to officials, be a fact within a few years.

This factory extension program is entirely independent from the big Ford plants to be put up in the River Rouge and Dearborn districts where the Ford tractor plant, the steel mills and possibly the tire plant are to be located, which will require another army of at least 25,000.

The most important feature in connection with the new buildings will be the erection of a foundry in which castings for an output of at least 5,000 Ford cars per day will be made.

The first new building to be started will be a duplicate of a six-story structure, 245 x 945 ft. on Manchester avenue, this addition being rather an extension to this structure, its total length will thus be 1,890 feet. At the end of this avenue, right near the boundary line of the Ford plant's property, another six-story building, 245 x 945 ft., is to be erected. On the Woodward avenue side of the Ford plant, the factory building right behind the general office building, is to be extended 800 ft. to the north, giving the plant a width of about 1,650 ft. on the avenue. In front of this factory extension there will be a duplicate general office building, four stories high. All the present one-story shops which extend hundreds of feet into the yards are to be enlarged so that their total length will probably be about 1,650 ft., and all will be made into four-story buildings.

It is said that the new manufacturing system, the increased production, the purchase of larger quantities of materials and other necessities, will contribute in reducing manufacturing cost and that both the company and the Ford purchaser will benefit by it.

Increasing American Citizens

There was an increase of 50 per cent. in applications for first papers toward American citizenship as compared to normal business, reported by the authorities in Detroit during the first three days of this week. Alven Macauley, vice-president of the Packard Motor Co., which employs 13,300 men, believes that the announcement of that company that promotion would be given only to American citizens, or to those who have signified their intention of becoming citizens, was responsible largely for this increase. Not one resignation has resulted at the Packard factory, according to J. H. Waller, supervisor of labor. It is estimated that 20 per cent. of the workers at the Packard plant are not yet American citizens. The Pack-

ard company will discharge no one who is not a citizen, and the workmen know that the late action was taken only through a broad and patriotic spirit.

The Spirit of Individuality

Winton individuality runs into big figures. "We give the buyer precisely what he wants in body styles, finishing leathers and fabrics, and color combinations," says General Manager Churchill, "and to facilitate selections we offer 36 different body designs, 72 color suggestions, five styles of leather and innumerable fabric patterns. Eliminating the fabrics from our calculation, we find that we have 12,960 possible combinations, which gives a fairly accurate idea of the range of selection a Winton Six buyer enjoys.

"In our business we have practically no 'standards' because we are building cars to please individual taste. A 'standard' implies that the manufacturer is asking buyers to accept his idea of taste. That's a thing we avoid. Our styles are suggestions merely, subject to variation as the buyer may desire.

"In the manufacture of low-priced cars, where the maker's object is quantity production, the buyer gets no opportunity to express his personal preferences as to how his car shall look. He must take what the maker decides to produce. That is one of the faults of the quantity system. It ignores the great fundamental human fact that half the joy of owning a real motor car is to own one that doesn't look like everybody else's car. Women know the meaning of that truth, for the pleasure of a splendid gown is half destroyed if duplicates are sold to others.

"The spirit of individuality is now so thoroughly a part of the Winton manufacturing system that the men whose duty it is to embody the buyers' personal tastes in Winton Six cars are doing the most artistic work the automobile industry has ever seen."

Eastern Associations Plan Federation

The Eastern Implement and Vehicle Dealers' Association held its annual convention at Philadelphia, January 25, 26 and 27. The convention adopted a resolution favoring the organization of an eastern Federation to embrace the Eastern Implement and Vehicle Dealers' Association, the New York Retail Implement and Vehicle Dealers' Association, and the Virginia and North Carolina Implement, Machinery and Vehicle Dealers' Association, and appointed a committee to take the necessary steps. The association elected the following officers:

President, H. A. Cook, Dutch Neck, N. J.

First vice-president, Andrew Schoener, Wormleysburg, Pa.

Second vice-president, W. M. Pogue, Rising Sun, Md.

Directors for four-year term, H. C. Pusey, Avondale, Pa., and Wm. Gehman, Macungie, Pa.

Page Buggy to Build Truck

The Page Bros. Buggy Co., of Marshall, Mich., is said to be perfecting the organization of a new company which will make a front-drive truck designed by E. H. Over-smith. The truck is to be assembled at the Page plant and a selling organization will be formed in Detroit from where the product is to be disposed. It is also stated that the new concern will be capitalized at \$100,000, all of which has been subscribed.

75,000 Motor Trucks Will Be Built in 1916

Henry Farrington, an authority in the motor truck field, estimates a sale of 75,000 commercial cars during the year 1916 and says that the country will see trucks used in ever-increasing numbers. Mr. Farrington estimates the value of the year's output at \$130,000,000. He says that the season of 1916 opens with a greater promise to the motor truck business than any previous year in the history of the business. At the beginning of 1912 there were only 20,000 motor trucks in use in the United States, while today there are 200,000. Mr. Farrington does not believe that the motor truck manufacturers need war orders. He points to the fact that all truck factories are working overtime to keep up with orders from American users. The parts makers, working night and day, are simply unable to supply the present demand. One year ago war orders were a blessing, but today the output of a majority of the plants in America is taken by American business, and the American business men who do not "shop" early are liable to find a shortage in this field. The 1916 season opens with a greater range of models and prices than ever before. Motor wagons from 350 to 500 pounds capacity sell at \$300 to \$750. In the 1,000 pound class prices range from \$550 to \$1,100. The 1,500 pound models show a price valuation of \$840 to \$2,100. A one ton truck can be bought at any price from \$870 to \$2,450. The one and one-half ton trucks vary in price from \$1,450 to \$3,000. In the two ton class one can choose between \$1,475 and \$3,000. Among the trucks of greater load capacity prices range all the way up to \$5,800. In the list of motor truck manufacturers are 221 makers of gasoline trucks, 24 electric wagon concerns, and two making steam trucks. Between them they list no fewer than 463 different models—407 gasoline, 53 electric and two steam. A significant sign that the vogue of the motor truck is country wide is the fact that these manufacturers are located in 31 different states, ranging from Massachusetts to Texas in the east and south, from New York to Minnesota in the north, and including Washington, Oregon and California in the extreme west. Michigan leads with 41 truck makers. New York is a close second, with 37, while Ohio, with 31, Pennsylvania with 25, Illinois with 20, Massachusetts with 13, Indiana with 12, and Wisconsin with 11, also cut a respectable figure in the list.

To Enlarge Plant

The wood-working plant of T. W. Minton & Son, manufacturers of wagon and auto parts and golf sticks, at Barbourville, Ky., and one of southeastern Kentucky's largest industries, will be greatly enlarged, as it has been running behind in filling orders for several months. A new department will manufacture handles and supplies for the mining trade. \$10,000 will be spent in improvements.

Body Plant for Lansing

The Gier Pressed Steel Co., Lansing, Mich., which will place on the market a new one-piece metal car body, has contracted for the erection of a new factory building, 160 x 600 ft., which will be one of the largest body making plants in the country. The company will spend at least \$150,000, it is said, on the new building and its equipment. There will be several new presses, one of which specially

constructed for the Gier concern, will cost between \$18,000 and \$20,000. Provisions have been made for a large increase in the production of light sheet metal products which have contributed in making the concern. During the past year the business increased nearly 150 per cent. over that of 1914, and the orders now on hand are at the rate or on a basis of nearly double the business of 1915.

Death of Richard Bryant

Richard S. Bryant, factory manager of the Standard Welding Co., died of cancer at the Post-Graduate Hospital, New York City, on January 28. He was an authority on automobile rims and invented a number of special types. He organized the Bryant Rim Co., Columbus, O., which was later bought out by the Diamond Rubber Co., Akron. He was then made consulting engineer of the United Rim Co., Akron, which was a holding company for several rim patents owned by the large rubber companies. Later he was employed by the Standard Welding Co. as consulting engineer, and quite recently was made factory manager. He was a member of the standards committee of the Society of Automobile Engineers. He was born at Leroy, Kas., September 22, 1869.

An American Car Tested in England

Officials of the Royal Automobile Club of London recently conducted a test of a prominent American car. Selecting at random a car out of a shipment of 44, they saw it taken from the shipping crate, and after adjustments requiring but 3 minutes and 39 seconds had been made, the car started on a trial run under the supervision of the club officials. The route included ordinary road and hill conditions, and covered 75.5 miles. The car ran well, and the consumption was but $3\frac{3}{4}$ gallons of gasoline, equivalent to 20.13 miles per gallon, or 29 ton miles per gallon, which must be considered remarkably satisfactory, especially in view of the fact that the car was new, and that the adjustments and preparations for the test were entirely superficial.

U. S. Government Invites Truck Bids

The Secretary of the Treasury, through the general supply committee, has sent out an invitation to gasoline and electric motor truck makers and dealers to submit bids, on March 6, for furnishing the executive departments and independent government establishments in Washington with a quantity of trucks during the next fiscal year, beginning July 1. The gasoline trucks will have a capacity of 1,000 lbs., 1,500 lbs., 2,000 lbs., 3,000 lbs., two tons and three tons. The electrics will have the same capacity. Rigid specifications have been drawn for the above mentioned trucks, and bidders will be required to strictly abide by them.

Riefing Co. to Expand

The Riefing Carriage & Wagon Co., of St. Louis, Mo., has leased a five-story and basement warehouse building at 509 North Main street, which it will use for manufacturing and equipping automobile delivery bodies.

The company is at present located at 914-16 North Broadway. Extensive alterations and improvements are being made to the building, and the Riefing company will take possession of the premises March 1.

U. S. Could Get 6,200 Trucks in 30 Days

The War Department has ascertained that 24,000 commercial trucks, valued at \$64,250,000 were exported for use by foreign armies between August, 1914, and December, 1915.

Army officers state that army quartermasters now are giving much attention to the equipment of army field and divisional trains. The view is expressed that the field trains that accompany troops should be animal-drawn, but that for divisional trains, supply, ammunition and sanitary trains motor trucks should be used.

With that end in view, a canvass has been made as to the resources of the country in that particular. The reports to the quartermaster general by manufacturers of trucks show that in 30 days 6,200 trucks could be furnished.

Hardwood Manufacturers' Convention

The fourteenth annual convention of the Hardwood Manufacturers' Association was held in Cincinnati, January 18 and 19. The meeting was very successful in every way, the addresses being of unusual interest, many distinguished speakers being on the program.

The following officers were elected for the ensuing year:

B. B. Burns, president—C. L. Ritter Lumber Co., Huntington, W. Va.

F. R. Gadd, first vice-president—Wisconsin Lumber Co., Chicago, Ill.

Ralph May, second vice-president—May Bros., Memphis, Tenn.

Leon Isaacsen, treasurer—Yellow Poplar Lumber Co., Coal Grove, O.

W. H. Weller, secretary, Cincinnati, O.

Breakage of Drills

Drills that are properly hardened and pointed are often condemned on account of breakage when the trouble should be rightly charged to the drilling machine. If there is any spring, lost motion, or backlash between the upper part of the machine and the table, the drill will not begin to cut until the pressure has taken this up, after which the feed will be practically constant until the point of the drill breaks through. As this happens the resistance to the penetration of the drill is abruptly reduced, and any spring or backlash in the parts of the machine will cause the drill to "hog in." The sudden increase in torsional strain which is thus produced, frequently causes drills to break.

The Price of Aluminum in England

The maximum price of aluminum has been fixed by the British government at £155 per ton for commercial quality delivered at the consumers' works. Private quotations have been as high as £210. Scrap aluminum has been averaging about £125 per ton.

Removable Upholstery

In the new Marmon 34 the upholstery is removable. It is made in sections, each section on a special form, and after the parts are finished they are hooked into the car and fastened on securely. It is claimed by the makers that this method of construction allows much better upholstery than could be secured formerly, and that it is

more uniform and finished. If it is desired it can be taken out and cleaned or replaced by some other kind of upholstery. For instance, a man can have a set of leather upholstery and a set of tapestry and alternate them as desired.

Wallace Coach & Carriage Co. Enlarges

A long lease has been secured on the property at 2803 Nicollet avenue, Minneapolis, Minn., by the Wallace Coach & Carriage Co. This building will be operated in connection with the present large automobile body and repair business in Grant street.

This new building is ideally equipped for automobile painting and repair work as it is a large, spacious one-story structure which will avoid the handling of heavy cars on elevators. Mr. Wallace, the head of this concern, says the present quarters are extremely inadequate to take care of their large increasing business of painting, building and repairing automobile bodies. Hence the expansion.

Rate Rehearing Asked

The National Implement and Vehicle Association has filed with the Interstate Commerce Commission a petition asking for a rehearing of the western advance freight rate case, so far as rates on agricultural implements are concerned. In a decision recently rendered the commission granted the railroads permission to advance rates 2 cents per 100 pounds throughout the western territory. The rehearing has been asked on the ground that the evidence was not sufficient to justify a finding in favor of an advance on implements, that such advance is contrary to some of the evidence offered and that the exhibits of the various railroads and shippers were erroneously analyzed.

Excelsior Seat to Make Bodies

Enlargement of the scope of the business has been decided upon by the directors of the Excelsior Seat Co., Columbus, O. For many years it has been engaged in the manufacture of seats and bodies for horse-drawn vehicles. Now it will add automobile bodies to the line. The special machinery is being bought and is to be installed at once.

Barbour Buggy Co. to Make Autos

The Barbour Buggy Co., of South Boston, Va., will manufacture cars in its plant as soon as R. A. Skinner, of Detroit, Mich., completes the models, drawings, patterns, etc. Two models will be constructed, four-cylinder and eight-cylinder, the four to sell at \$750 and the eight at about \$950, both on the same chassis.

Broken Screws

These often break below the surface of the metal in a dead-end hole. An excellent method of removing them is to drill a hole in the broken screw and force in the tang of a file, afterwards turning to unscrew. This will in most cases effect the purpose.

Of the 157 leading commercial motor truck builders, 89 use worm-drive trucks. Of these 89, 57 use the worm drive exclusively, while 52 still continue to make also chain-driven trucks.

Gasoline Is Cheap at Any Price

Carefully kept figures show that oil, gasoline and grease form the least of all an owner's expenses in operating and maintaining an automobile. This is true at even the present prices for gasoline, according to National Petroleum News, which attempts to place the burden of automobile upkeep where it thinks it belongs, in the following article:

"The oil trade should carry this back home as vigorously as possible to every prospective automobile owner and every automobile manufacturer in the country, and every one else who talks about the 'high price' of gasoline.

"Gasoline and Oil at Any Price Are Cheap

"The automobile trade should be made to realize this. The burden of the high cost of automobiles should be put where it belongs—on the automobile itself, on the service station for repairs, on the garage for maintenance, washing, etc., and on the tire manufacturer, and the manufacturers of all the accessories.

"Detailed cost, as kept by H. C. Mather, president of the Moore Oil Co., of Cincinnati, on a Haynes four-cylinder car covering two full years show the above statements to be true. Mr. Mather says he doesn't think there was a single penny that escaped the books. The car upon which these figures were kept was bought originally at a cost of \$1,800, and sold in the spring of 1915 for \$650, after being driven a total of 15,337 miles.

"The expense of this car per mile, was, fixed charges, 10.5 cents; upkeep, 4.1 cents; oil, gasoline and grease, 1.3 cents; tires, 1.8 cents; making a total cost of 17.7 cents.

"The average price of gasoline charged to the car was about 12 cents a gallon over the two years' time, adding 8 cents to that price to get the market price of 20 cents in effect in Ohio today, the total cost item of his oil at today's price is given, which is 1.96 cents per mile. But tires have advanced. They went up 20 per cent. within the last 30 to 60 days, and it is authoritatively reported they will advance another 20 per cent. shortly. The first advance, on Mr. Mather's cost, amounts to .36 cent per mile, bringing the tire cost up to 2.16 cents per mile. Another 20 per cent. advance will bring that cost up to 2.6 cents per mile, so that oil, gasoline and grease continue to be the cheap element in the cost of maintaining and operating an automobile.

Mr. Mather's total fixed expense for the two years were:

Depreciation	\$1,150.00
Interest at 5 per cent.....	150.00
Taxes	24.00
Insurance	155.50
Garage	120.00
Licenses	10.00

Total fixed expense.....\$1,609.50

"His mileage was 15,337 miles, making his fixed expense per mile of 10.5 cents. His upkeep charges were as follows:

Service	\$104.50
Repairs	396.97
Miscellaneous expense	24.45
Painting and varnishing.....	75.00
Re-covering top	35.00

"Total upkeep for two years was \$636.02, equivalent to 4.1 cents per mile.

"Oil, gasoline and grease costs totaled \$197.52 in the two years, equivalent to 1.3 cents per mile.

"Tires for two years cost \$275.91, at the rate of 1.8 cents per mile.

"Mr. Mather fixed his depreciation by deducting from the original cost of the car what he got for it when he sold it. The up-keep items, he points out, include service, tips and charges for washing, which were small, because he had the work taken care of at his plant. If he had had the work done at a public garage or had employed a driver, the upkeep cost would have been a great deal larger. The repair work covered incidental adjusting, renewal of batteries and lights and one accident which cost \$55.

"His tire item, he says, was small, due to the fact that he only charged to the account money actually expended for tires. When the car was sold, the tires were not in very good condition, and he thinks it would have cost at least \$100 to have put them in good shape.

"But, one may argue, these items are for a large, expensive car. The cost of gasoline is altogether different for the owner of a Ford car. That is not true, however, if you will stop to figure it out. The average Ford car in a certain district, according to the manager of that district, used, according to careful statistics, 263 gallons a year. At 15 cents a gallon, that owner paid \$39.45 a year for his gasoline. At 20 cents a gallon, the present price in this same district where the 15 cent price prevailed a year ago, that owner is paying \$13.20 additional, or an extra charge per month of \$1.10. Out in the west, where gasoline was 11 cents a gallon, that owner paid at the rate of \$28.93 a year for his gasoline, and today, on a 15 cent market, he is paying \$10.52 additional, or at the rate of 87½ cents a month increased expense for gasoline.

"When you give these figures to a Ford owner, don't let him get away with the talk that that is in the neighborhood of 10 per cent. of the cost of the car. Point out to him that in all probability he has fallen victim to the Ford Company's policy of selling him practically a stripped car and making him buy all the other parts that go to make motoring comfortable today; that, therefore, his car probably cost him some \$600 or \$700 before he had it equipped to make driving it a pleasure.

"Point out to that owner that he will pay \$10 to a so-called Ford Association for the alleged purpose of buying his gasoline at a cent off the market, which, according to his company's own figures, would amount to a 'saving' to him of \$2.63 a year. Bring it home to him forcibly that he is giving some one \$7.37 as a Christmas present in addition to paying him for the 'saving' of \$2.63. Tell him that such 'associations' can afford to cut the market, because they more than make it up out of the dues and the extra charges that they assess for other supplies; but that the oil trade has a little bit too much conscience to come any such game as that on him.

"Above all, keep bringing the talk home that the automobile manufacturer, the garage man and the tire manufacturer are all parties to the cost of automobiles, while the oil trade is trying to make motoring as cheap as possible. Put these other interests on the defensive until they recognize the fact that gasoline at any price is cheap. They have no license to pull themselves up into an alleged low maintenance cost by pulling the oil man down.

"Send your talking points on the cheapness of gasoline in with a vengeance, especially to the man who buys cord tires at \$50 a tire and then kicks on a few dollars a year more or less on gasoline; show him what a 20 per cent. increase on \$200 worth of tires a year amounts to—\$40, and make him appreciate that, according to all reports,

there is going to be still another 20 per cent. advance, which will make his tires cost him \$80 a year more.

"Who is taking the auto owner's money?"

"What little the oil man gets he has to pay out for a greatly increased cost of gasoline at the refinery, and the refiner must pay it out for a greatly increased cost for the crude oil, and the oil producer must pay it out for a very high expense of wildcatting to find the new fields to take care of this country's demand.

"Copy Mr. Mather's figures and show them to every automobile owner in your district and tell them, if they live in a city, that Mr. Mather's figures are unusually conservative because he did not charge himself for the cost of maintaining a garage at his plant, nor for a lot of service performed there. Had he done as thousands of other men do—driven down town in the morning and home at night, he would have to have paid from \$6 to \$10 a month for day garage rental, a total of \$72 to \$120 a year, according to just how conveniently the garage was located and that while housing the car in this garage he would have many little things attended to—at a cost of 60 cents an hour. Point out further to that man that if he had a son or daughter who drove him down in the morning and came for him again in the evening, he would pay almost \$6 a month more for the additional mileage used.

"If that man is in New York or Chicago, for instance, point out to him that in all probability he is keeping his car altogether in a public garage, and that he is paying anywhere from \$15 to \$35 a month rental, to say nothing of all the other charges that find their way on his bill each month.

"In talking to a man or writing to one who may be complaining about the alleged high cost of gasoline, don't let him overlook anything. Tell him about the robes, anywhere from \$5 to \$20 each; the driving gloves that are anywhere from \$2 to \$10 a pair; the driving coat at from \$25 to several hundred dollars each; the shock absorbers, snubbers, chains, clock, additional searchlight, seat covers, spark plugs, warming devices for the car and for the steering wheel, brake lining and all the hundred and one other things that the average motor car owner buys in the course of a year.

"The chances are that 15 to 20 cent gasoline today will be with us for a number of years, if not even longer, and the oil trade might just as well shove the burden of the alleged high cost of automobiles from their shoulders and put it where it belongs now, as at some future time. The longer the oil trade delays, the oftener will ignorant Congressmen and other critics bark and ballyhoo about the high cost of automobiles, due to gasoline.

"It's up to the oil trade to make every man appreciate that gasoline at any price is cheap."

94,437 Overlands in 1915

The Willys-Overland Co., Toledo, O., made and sold 94,437 Overland cars in 1915. This is at the rate of 315 per day on the basis of 300 working days. In 1914 the number of cars made was 48,468, or at the rate of 161 per day during 300 working days. The increase during the past year was 45,969, or nearly double the 1914 output.

The way production is now going on even the great record of 1915 will be far outdistanced, as production is now already at the rate of more than 700 cars a day, the record to date being 722 in 24 hours.

Mais Truck Taken Over by Premier

Mais Motor Truck Co., Indianapolis, Ind., has been taken over by the Premier Motor Corp., of Indianapolis, Ind., and the manufacture of the Mais truck will be continued there. The officers of the newly organized Premier Co. are: E. W. Steinhart, president; F. W. Woodruff, vice-president; Frank E. Smith, secretary, and E. W. Steinhart, treasurer. The board of directors consists of these officers and Harry L. Thompson and George A. Barr.

Chicago Show Attendance

The attendance figures of the Chicago Automobile Show as announced by Manager Miles after the count, showed 282,396, an average of slightly over 40,300 people daily. These figures are said to exceed the New York attendance by 30,000, although it was stated at the close of the New York show that the total attendance had been 325,000. The latter figure included complimentary tickets and exhibitors' admissions.

Somewhat Inconvenienced

The Hickman Wagon Co., of Hickman, Ky., was somewhat inconvenienced recently when a part of its property was under water, as a result of the breaking of the Mississippi River levee in the lower part of the city. The greater part of the western Kentucky town has been under water.

Tire Plant for Chicago

Chicago will have its first automobile tire factory. Geo. B. Dryden, president of the Dryden Rubber Co., has purchased the vacant northwest corner of West Twelfth street and Kildare avenue, 248 x 398, for \$20,000, upon which a factory for the manufacture of automobile tires and tubes will be erected in the spring.

Hupp Discontinues Yearly Models

The Hupp Motor Car Corp. announces that starting with January 1, 1916, Hupmobiles will be designated by series and not by the yearly types as heretofore. The first one brought out as the 1916 Model N will hereafter be known as Series N.

Banner Buggy Co.'s New Catalog

The Banner Buggy Co.'s catalog for 1916, which it designates as "No. 34," is a fine piece of work from a printer's standpoint, as well as a splendid exposition of silent salesmanship. A full page picture of the new president, W. H. Roninger, graces one of the front pages.

The Massachusetts legislature has passed a bill to allow motor dealers and garage men to sell supplies like oil, gasoline, tires, etc., and to do necessary repair work on Sundays. Under the law as it stood it was illegal to make any repairs or sales on Sundays, and a Springfield judge convicted a garage man for doing it, warning him and others in that city to refuse to sell anything in future.

The Willys-Overland Co., Toledo, O., has made arrangements with the Springfield Metal Body Co., Detroit, Mich., by which it obtains the right to use any of the Springfield Body Co.'s patented constructions in the building of its own bodies for a period of ten years.

Trade News From Near and Far

Business Changes

J. G. Proch, a retailer in vehicles at Dean, O., has discontinued business.

Krueger & Grahn have succeeded to the implement and vehicle business of Krueger & Lambrecht, Princeton, Wis.

G. W. Pace has sold his retail store and stock of vehicles and implements at Newcomerstown to E. R. Swigert.

H. J. Landers, of Elizabethtown, Ky., recently purchased the implement and vehicle business of A. H. Miller.

C. G. Crocker sold the Menomonie (Wis.) sleigh and wagon works to V. J. Savidusky, who will operate the business.

George W. Tanner, at Barlow, Ky., has disposed of his implement and vehicle business to the E. B. Ferguson Implement Co.

Hans L. Hanson has sold his implement, vehicle and harness business at Flagg Center, R. D. Rochelle, Ill., to Eaton & Hanson.

Dewey Renkes is the new owner of the implement and vehicle business formerly conducted by C. J. Wilkins at Garden Plain, Ill.

Wood & McNair have been succeeded in the implement, vehicle and hardware business at Kemp, Tex., by the McNair Hardware Store.

Sexton Bros, a hardware, vehicle and implement concern of Murray, Ky., has taken over the entire business of the Murray Saddle and Harness Co.

The implement and vehicle firm of Simpson, Johnson & Co., at Diagonal, Ia., is closing out its stock and announces that it will discontinue business.

The O'Donnell Barrow Co., Washington, Ind., sold the harness, vehicle and implement departments to Jacob G. Clark, Louis H. Keith and Wm. L. Vance.

John H. Doering has sold his harness, vehicle and implement business at Wakaruse, Ind., to Adam Culp. J. W. Churchill will have charge of the harness department.

New Firms and Incorporations

W. H. Hafendorfer will engage in the vehicle business at Owensboro, Ky.

The Liberty Motor Car Co. has been incorporated at Detroit, Mich.; capital \$400,000.

A new concern, known as the Celina Implement Co., has been formed at Celina, O., to retail implements and vehicles.

Simmons Wheel Co., of San Antonio, Tex., capital stock, \$30,000. Incorporators: Oliver G. Simmons, D. J. Woodward and J. M. West.

Warthen Mercantile Co. has engaged in business at Warthen, Ga., and will erect a building for the purpose of handling vehicles, implements, etc.

The Keith-Clark-Vance Co., Washington, Ind.; capital \$10,000; to buy and sell implements, buggies, harness

and automobiles; directors, Louis H. Keith, Jacob G. Clark and William I. Vance.

Convertible Auto Body Mfg. Co., of Indianapolis, Ind. Capital \$25,000; auto bodies. Directors: W. O. Cornwell, B. F. Cartwright and Jennie Cartwright.

The Malcolm Motor Car Co., to manufacture automobile passenger cars and trucks; capital \$1,000,000. Incorporators: F. D. Buck, Geo. H. Dillman and M. L. Horthy, Wilmington, Del.

The Green Camp Grain Co., Green Camp, O., capital \$6,000; dealing in grains, flour, etc., wagons, buggies, etc.; incorporators, Ralph C. Peet, Curtis M. Ross, D. E. Kirts, H. H. Gill, R. R. Gill.

The Hascall Motor Truck Co., Painesville, O., manufacturers, incorporated; capital \$100,000. Incorporators: I. Amster, E. M. Denner, L. S. Lommason, J. C. Barkley and John P. Dempsey.

General Vehicle Trade News

The Covert Motor Vehicle Co., Lockport, N. Y., is enlarging its plant.

It is reported that three additional automobile factories will be established in Detroit.

The Maxwell Motor Co., Detroit, Mich., proposes to establish a branch factory at Windsor, Ont.

The Stutz Motor Car Co., Indianapolis, has let a contract for a four-story addition to its plant, to cost \$100,000.

The Motor Truck Body Co., 320 Franklin street, Detroit, has begun the erection of a factory, 64 x 245 ft., one story.

The Timken-Detroit Axle Co., Detroit, will erect a building to cost \$100,000, to be used for a malleable iron foundry.

The Convertible Auto Body Mfg. Co., Indianapolis, has been incorporated with \$25,000 capital stock to manufacture automobile seats.

The Alter Motor Car Co., Detroit, has increased its capital stock from \$75,000 to \$150,000. It operates an automobile plant at Plymouth, Mich.

The Continental Auto Top Co., St. Louis, Mo., has acquired a site and will erect a new plant for the manufacture of automobile tops and bodies.

The Portland Body Works Co., Portland, Ind., is building an addition to its plant, 64 x 48 ft., two stories, to take care of recent growth in business.

The Liberty Motor Car Co., Detroit, has been incorporated with \$400,000 capital stock to manufacture automobiles. George B. Allen is a stockholder.

Chalmers sales in the month of January were more than 12 times as great as in January of last year. The plant is on a continuous night and day schedule.

The American Body Co., Buffalo, manufacturer of automobile bodies, will erect a two-story brick and steel factory addition to its plant on Niagara street.

The Chandler Motor Car Co., Cleveland, has placed a

contract for the erection of a one-story repair shop, 60 x 160 ft. Two more stories will be added later.

The Highland Body Mfg. Co., Elmwood place, Cincinnati, has had plans prepared for an addition to its plant for which wood-working equipment will be needed.

The Chevrolet Motor Co., Flint, Mich., will erect an additional manufacturing building immediately. It is reported that a large amount of equipment will be purchased.

E. H. Ovesmith, Marshall, Mich., is at the head of a new company, capitalized at \$100,000, which proposes to engage in the manufacture of automobiles at Marshall.

The All-Steel Motor Car Co., LaSalle Bldg., St. Louis, Mo., will equip its factory at Macon, Mo., for operation by early fall and in the meantime will assemble cars in St. Louis.

The Kelsey Wheel Co., Detroit, manufacturer of automobile wheels, has increased its capital stock from \$1,000,000 to \$1,500,000. It has enjoyed exceptional prosperity the past year.

The Long Mfg. Co., Detroit, manufacturer of automobile radiators, is planning to increase its facilities by the erection of additional stories which will double the capacity of the plant.

The Turner & Moore Mfg. Co., Detroit, manufacturer of large parts for automobiles, is having plans prepared for a factory, 75 x 300 ft. New machinery will be installed, including power equipment.

T. W. Minton & Son, Barbourville, Ky., manufacturers of wagon and automobile parts and golf sticks, will enlarge their plant. A department to make handles and mining supplies will be equipped.

The Eagle-Macomber Motor Car Co. will establish a plant and main office in Sandusky, O. The building formerly occupied by the Suspension Roller Bearing Co. will be used for assembling purposes.

R. H. Evans & Co., 8 East Long street, Columbus, O., have been awarded contract for the construction of an assembling plant for the Ford Motor Co. to be located at Cleveland and Buckingham avenues.

The Light Car Axle Co., successor to the Clark Delivery Car Co., 1035 East 76th street, Chicago, will move its plant to Kalamazoo, Mich. S. C. Kyle, president of the company, has announced that new equipment will be added.

The H. A. Lozier Motor Co., Cleveland, will soon establish its plant for the manufacture of automobiles. It plans to acquire floor space, and as the car will be largely an assembling proposition, little machinery will be required.

The Overland Automobile Co., St. Louis branch, has acquired a site for the erection and equipment of a building to cost \$250,000, which will be provided with a large repair and assembling shop, including traveling crane, drying and baking ovens, etc.

The Lehr Motor Co., Saginaw, Mich., has been incorporated with \$500,000 capital stock to manufacture automobiles. The incorporators are W. M. Guider, Alfred F. Myer, Curt M. Schwan and Harry D. Mackaye. Manufacturing operations will be carried on at Saginaw.

The Chalmers Motor Car Co., Windsor, Ont., has been incorporated with a capital stock of \$1,000,000 by Clarence A. Pfeffer, vice-president and secretary; Hugh Chalmers,

William P. Kiser, all of Detroit, Mich., and Alexander R. Bartlet, Windsor, Ont., and will build a plant at either Windsor or Walkerville, Ont.

Construction of a new one-story office building, 300 ft. long, will be started shortly by the Briscoe Motor Co., Jackson, Mich. An addition is now being erected to the motor department, also a one-story stock room, between the motor and assembly rooms. Gradually other enlargements will be made and by the end of July it is expected that there will be room to give employment to at least 2,000 men.

The Oakes Co., Indianapolis, manufacturer of automobile parts, has orders booked a year ahead. It is proposed to enlarge the plant. The Oakes Pressed Steel Co. and the Oakes Co., both manufacturers of automobile parts, were recently consolidated under the name of the Oakes Company and the capitalization was increased from \$100,000 to \$175,000. Warren D. Oakes was president of the Pressed Steel Co. and Will H. Oakes president of the Oakes Company.

The Willys-Overland, Ltd., Toronto, has been incorporated with a capital stock of \$6,000,000 by James S. Lovell, 25 King street West; C. Delamere Magee, 300 St. George street; John J. Dashwood, 25 King street West, and others. This company was recently amalgamated with the Russell Motor Car Co., West Toronto, and is considering the erection of a factory near the Russell plant to manufacture automobiles, war munitions, etc. T. A. Russell, care of the Russell Motor Car Co., West Toronto, Ont., is vice-president of the Willys-Overland Co.

Doings of Truck Builders

The Standard Motor Truck Co., Detroit, will enlarge its plant by the erection of a three-story addition about 125 x 150 ft.

The Vim Motor Truck Co. has begun the construction of a million dollar factory in Philadelphia, where next year 30,000 trucks will be produced.

The J. C. Wilson Co., Detroit, Mich., which makes the Wilson truck and is also manufacturing tops, has increased its capital stock from \$20,000 to \$225,000.

The Smith Form-A Truck Co., Chicago, has acquired a site, 200 x 662 ft., at 56th street and 58th avenue, Clearing, upon which a plant will be erected at once. The first unit will be 176 x 362 ft.

An addition three stories high will be put up by the Standard Motor Truck Co., Detroit, Mich., which will provide 60,000 sq. ft. of additional floor space. Business during 1915 was more than double that of the preceding year.

The Kissel Motor Car Co., Hartford, Wis., has purchased a tract of 17 acres adjoining its plant to provide room for future extensions and additional storage and switch-yard facilities. Plans are being prepared for several additions, to be undertaken when buildings now under way are completed.

Rollin H. White, formerly vice-president of the White Company, who has not been active in the management of that concern for some time, has bought a 38-acre tract in Cleveland, upon which a new plant for the manufacture of farm tractors will be erected. The new works will cost \$200,000. This is only one portion of the plant that it is

expected eventually to utilize. The Nickel Plate railroad runs through the property, affording excellent shipping facilities.

The Packett Motor Car Mfg. Co., St. Paul, Minn., of which Henry H. Orme, president of Henry Orme Sons, founders, will be president, has been organized with a capital of \$150,000. The company has taken over the Braisic Truck Co. and will continue the manufacture of the Braisic delivery wagon with Frank Braisic as manager.

The Four-Wheel Drive Automobile Co., Clintonville, Wis., has increased its capital stock from \$250,000 to \$500,000, the additional issue to be distributed as a 100 per cent. stock dividend. A cash dividend of 30 per cent. was declared at the annual meeting. The company expended about \$100,000 in works extensions the past year and is now buying a considerable list of tools.

A two-ton truck designed by Howard P. Woodworth, formerly with the Republic Motor Truck Co., Alma, Mich., will be made at Bay City, Mich., by a new truck company now being organized. This was decided at a meeting of business men at the Board of Commerce. Ten men agreed to furnish capital and James R. Tanner was appointed to look after all the necessary preliminary work.

Among the Tire Makers

The Mason Tire & Rubber Co., Kent, O., has awarded contracts for an addition to cost \$50,000.

The Kelly-Springfield Rubber Co., Akron, O., has acquired a site at Barberton, O., on which it plans to erect a plant.

The Motor Tire Reconstruction Co., of New York, will build a factory at Wakefield, Mass., for its New England branch, work being started on a structure so designed that it may be enlarged from time to time.

The Salem Rubber Co., Salem, O., is being organized with a capital stock of \$600,000 to take over the plant of the American Case & Register Co. for the manufacture of automobile tires. A. E. Gordon, Canton, O., is a promoter of the new company.

The Kelly-Springfield Tire Co. reports for 1915 a balance for dividends of \$1,706,744, equal to 29 $\frac{2}{3}$ per cent. on the \$4,834,000 common stock, against 23 $\frac{1}{5}$ per cent. on \$4,000,000 the previous year. The gross profits were \$2,880,080 as against \$2,203,761 in 1914.

The Tubeless Tire & Rubber Co., Millersburg, O., with a capital stock of \$75,000, will establish a plant for the manufacture of automobile tires in a building now occupied by the Helmuth Slate & Steel Co. W. R. Price is president and G. J. Jordan, secretary and treasurer.

The Miller Rubber Co., Akron, O., will enlarge its plant by the erection of two additional buildings, one eight stories, and also the extension of one of its present buildings. The Star Rubber Co., Akron, O., will also enlarge its plant by the erection of a three-story building, 62 x 97 feet.

L. J. Weadock and C. E. Sprague, of Toledo; G. W. Doerzbach, J. J. Daach, J. T. Sloat and Sidney Frohman, of Sandusky, have incorporated the Continental Rubber Co., Sandusky, O., with a capital of \$500,000, to manufacture automobile tires. The company has made arrangements to take over the now occupied plant of the Erie Reduction Co., in the southwestern outskirts of the city.

OBITUARY

Christopher Columbus Bradley, 82, died January 29, at his home in Syracuse, N. Y., following a two weeks' illness. He was the son of the original Christopher Columbus Bradley, who was born in Groton, Tompkins county, N. Y., in 1800, and died in Syracuse in 1872. The first firm of Bradley was established in Syracuse in 1832 by Mr. Bradley's father. This was the first foundry and machine shop established in Syracuse. The Bradley family came to Groton just after the revolutionary war and the first C. C. Bradley came to Syracuse some time prior to 1832. The first firm of Bradley ran under the name of C. C. Bradley. In 1855 the first C. C. Bradley took his sons Waterman C. Bradley and C. C. Bradley, Jr., into the firm under the title of C. C. Bradley & Sons. They did a general foundry business, all kinds of blacksmithing, made plows, scrapers



and contractors' supplies, ran a machine and woodworking shop and made repairs of all kinds. In the sixties W. C. Bradley withdrew from the firm and removed to New York and the firm continued as C. C. Bradley & Son. The firm operated under the name of Bradley & Company and The Bradley Company at different times up to 1894 when the present firm of C. C. Bradley & Son, Inc., came into existence with the second and third C. C. Bradleys and Miss Cora M. Bradley as officers and directors.

In the seventies the firm of C. C. Bradley & Son were large manufacturers of reapers, mowers, hay rakes, etc. C. C. Bradley, 2d, the object of this sketch, was a mechanic of no mean ability as well as being a prolific inventor. He perfected the Bradley harvesting machinery. A Bradley reaper was the first machine of the kind to go to Russia. The firm gradually retired from the agricultural implement business and took up the manufacture of the Bradley cushioned power hammers. Mr. Bradley took out numerous patents on hammers and brought them to their present state of perfection.

In the eighties the firm engaged in the wholesale car-

riage business and besides making some 50 or more styles of carriages and in quantities up to 5,000 jobs per year, they specialized on the Bradley two-wheeled jogging and village carts, traps, buckboards, etc., etc. Mr. Bradley got out many improvements and took out many patents on horse-drawn vehicles and accessories. About 1890 there was brought to his attention a patent on a quick shifting carriage shaft coupling whereby shafts and pole could be changed in 10 seconds and with no tools except the hands. This original patent of the cam lever device was taken out by William Henry Hannan and later purchased by C. C. Bradley & Son, Inc. Mr. Hannan's patent covered a straight bearing coupling and it was soon found that with this device the shafts had to be aligned perfectly, otherwise the couplings would bind. Mr. Bradley set about to remedy this defect. He invented the present ball bearing carriage shaft coupling which bears his name. The first ball bearing couplings were made with a solid steel ball. These balls wore excessively especially in a sandy country and unless greased frequently would squeak. Mr. Bradley conceived the idea of reducing the size of the steel ball and surrounding it with a very hard pressed belt leather packing. This solved the problem of the squeak and excessive wear. It was demonstrated that the outside of the packing being of greater diameter than the inside the leather did not move in the coupling but the steel ball moved slightly in it. Mr. Bradley took out the several patents in connection with this packing, including the retaining ring which kept the packing in place when changing the shafts or pole.

Mr. Bradley invented the Bradley holdfast coupler and many others, some of which were never put on the market. He probably took out at least 25 patents on carriage shaft couplers and spent a small fortune prosecuting infringers and defending his patents.

When he started in to make carriage couplers quick shifting couplers were practically unknown.

Mr. Bradley was a quiet man and loved his home more than anything else. He was a member of several clubs, but rarely went to them. Up to the time he became 75 years old he always had a stable full of horses, and they were the best he could find. Horses were his only amusement. About six or seven years ago his doctor prescribed an automobile for him. He balked at this and said that was the last thing he ever wanted. He was finally persuaded to try one and finally became converted. Mr. Bradley was a member of the C. B. N. A. and had been for more than 30 years. Up to six or seven years ago he attended every convention and was well known to practically all the members. One of the prominent men of the carriage trade has passed away but he will not be forgotten by anyone who ever knew him.

Besides his wife, Mr. Bradley leaves two daughters, Miss Cora Bradley and Mrs. Harriet Bradley Woodle, and a son, C. C. Bradley, Jr.

George Apfel, vice-president and general manager of the Enterprise Brass and Plating Co., Cincinnati, O., died December 30. He had been ill for more than two years and for a large part of that time he was confined to his home. The deceased was a member of the Cincinnati Carriage Makers' Club. It is reported that Mr. Apfel's widow and his nephew, C. Kloos, together with John Huth, will continue the business at its new location, south-east corner of Sixth and Baymiller streets, Cincinnati.

George A. Biemer, 76, of Fort Wayne, Ind., founder of the Old Fort Wayne Wagon Works, passed away at his home in that city on January 25. He had been a sufferer for the past 18 months from dropsy. He is survived by four sons.

Henry Croos, 85, a former well known carriage manufacturer of Tiffin, O., died at his home in that city, January 19. He had lived in Tiffin for 65 years and was a veteran of the civil war.

Edward E. Ellis, 80, a retired carriage manufacturer of Dedham, Mass., died February 5 at the home of his daughter, Mrs. Alice R. Hutchinson, 461 High street, Dedham. He was born in Medway, Mass., and when 28 years of age enlisted for service in the civil war. He served three years and then returned to Boston. For 16 years he was employed at Hall's carriage factory in Hawkins street. After that he went to Dedham and conducted a carriage factory of his own for 20 years. He leaves a widow and one daughter.

Wm. D. Gordon, 55, for the past ten years representing the Sheldon Axle & Spring Co., of Wilkes-Barre, Pa., throughout the west and northwest, died at his home in Peoria, Ill., on January 15. He was stricken with apoplexy the previous day while attending a social gathering with a few intimate friends, never regaining consciousness. A year ago he was in Chicago and met with an accident, being knocked down by an automobile. Since then his health had been indifferent and vitality seemed lacking. Few men are more widely known throughout the central west and few numbered more sincere friends. Peoria had been his home for the last 22 years. He was a whole-souled, optimistic temperament, a man of highest character and business capacity, generous to a fault and a man among men. Mr. Gordon was born in Lancaster, O. He is survived by his wife, his mother, and two sons.

Isaac Newton Higgins, 74, of Shelbyville, Ind., recently passed away at his home in that city from pneumonia. He was a wagon manufacturer in Shelbyville for many years.

McDonald Lindsay Wrenn, 57, vice-president of A. Wrenn & Sons, Norfolk, Va., and president of the Citizens' Bank of that city, died suddenly at his home on December 26. Mr. Wrenn had not been well for several weeks, but had been able to attend to business affairs up until a few days before he passed away. Death was due to arterial trouble. Mr. Wrenn was a man whose interests were far reaching. He had been vice-president of the firm of A. Wrenn & Sons since its incorporation under that name in 1909. He had been connected with the bank in an official capacity since 1890. He served the city of Norfolk in the office of chairman of the finance committee of Common Council for several years. Aside from his business interests, he was actively interested in church work, being a member of the Methodist church, to which he gave a large part of his time. He was greatly interested in the Turney Home for Boys and the Ballentine Home, both of Norfolk, and was on the board of directors of both institutions. He was also active in the work of the Y. M. C. A., and in all of the charities of Norfolk. Mr. Wrenn is survived by his wife, one son, three sisters and two brothers, one of whom is Charles O. Wrenn, ex-

president of the Carriage Builders' National Association, and president of A. Wrenn & Sons, Norfolk.

Samuel O. Porter, 62, the last of the old line carriage makers of Maysville, Ky., died on January 24 after a brief illness of pneumonia. He is survived by his wife and five children.

Jacob S. Valentine, who until recently conducted the Valentine Carriage Works in Trenton, N. J., died January 9 at his home in that city. His widow and four daughters survive him.

William Weydenmeyer, 63, for many years a carriage manufacturer, at Bloomsburg, N. J., is dead.

Business Troubles

W. W. Kilpatrick & Sons, dealers in harness and buggies at Comanche, Tex., have filed a voluntary petition in bankruptcy. Liabilities, \$8,186.22; assets, \$5,768.31.

A voluntary petition in bankruptcy was filed in United States District Court February 8 by the William T. Fulton Co., vehicle dealers of Dallas, Tex. Liabilities are scheduled at \$44,121.48 and assets at \$31,279.53.

Philadelphia Carriage and Wagon Builders

At the regular monthly meeting of the Carriage and Wagon Builders' Association of Philadelphia, held at the Hotel Hanover on Friday evening, January 21, subjects of interest to manufacturers of carriages, wagons and automobile bodies were discussed, most of those present taking part.

For the benefit of the association's treasury, a performance was given at two leading Philadelphia theatres on the evening of Monday, January 31. A large number of tickets were sold and a big representation of vehicle builders and their friends were present at both of the theaters on that evening. A theatrical benefit has become an annual affair of the Philadelphia association and it is one of the methods used to supply the funds for the various activities in which the association takes a leading part. Principal among these is the financial guarantee which they give to the Technical School for Vehicle Draftsmen, conducted in the Central Y. M. C. A., Philadelphia.

Boston Carriage Manufacturers Gather

The Carriage Manufacturers' Association of Boston and vicinity held its fourteenth annual banquet at the Revere House the evening of January 24 with 100 members and guests present. President M. W. Quinlan, Jr., presided. Following the dinner a musical and vaudeville entertainment was presented by professional artists. The entertainment committee was made up of President M. W. Quinlan, Jr., Albert A. Sargent, James H. Waddell, John W. Campbell and James A. Kiley.

Cincinnati Carriage Makers' Club

There was an attendance of 40 at the January meeting and dinner of the Carriage Makers' Club, which took place on the evening of the 13th at the Business Men's Club.

Hon. John W. Haussermann, who was to be the speaker of the evening, was unable to make his appearance, on account of the "high water" at New Richmond, O., which is his home; but he has assured the club that he will be with them at the next meeting. Mr. Haussermann spent

17 years in the Philippines, and was to give the club a talk on the manners and customs of those islands.

The applications of H. H. Hutchinson of The Hutchinson Bros. Cut Leather Co., of Cincinnati, and G. C. Messinger, of The Murphy Varnish Co., Chicago, were read and accepted.

Theo. Luth, chairman of the Freight and Classification committee, reported \$80 still remaining of the \$300 which the club donated for the use of the freight and classification committee. It was decided to turn the \$80 over to the Publicity Committee of the Carriage Builders' National Association.

The following gentlemen were appointed on the Nominating Committee to report at the next meeting for the election of the new board of governors, this election to be held in March, which is the time for the annual election of the club: Geo. S. Brown, chairman; A. S. Brown, J. F. Taylor, C. J. Rennekamp and Irvin Bauer.

A committee was appointed to send a letter of condolence to the family of the late Geo. C. Apfel. The committee is composed of O. E. Walker, chairman; W. J. Brunsman, and Theo. Luth.

Organize Columbia Motors Co.

J. G. Bayerline and W. L. Daly, former president and sales manager, respectively, of the King Motor Car Co., have launched the Columbia Motors Co., Detroit's latest automobile company. In addition to Bayerline, who is general manager, and Daly, who is vice-president and in charge of sales, other members of the new organization are: A. T. O'Connor, secretary, who was formerly with the Olds, Packard and Abbott companies; F. A. Bollinger, factory manager, who was formerly in the same capacity with the King company; Ray Long, engineer, formerly assistant engineer of the Saxon Motor Co.; John Molerhardt, superintendent, who was also formerly with King. W. E. Metzger, well known in automobile circles, is one of the directors.

It is stated that all of the capital stock has been subscribed and an option on a plant in Detroit has been secured. The first demonstrators of the new car, which is a six, to sell at about \$900, will be out about March 1, and dealers' cars are expected to be out by June 1. The output for the first year will be 2,500 cars.

Still Making Wagons

The Tiffin (O.) Wagon Co. states emphatically that a report to the effect that it had withdrawn or contemplated withdrawing from the farm wagon business is utterly false. The company is doing a prosperous business and reports the outlook exceedingly favorable, as there is a lively demand for wagons and the company has not the remotest intention to discontinue this line. All dealers are assured that the business will be conducted even more energetically than in the past.

Deal Buggy Company Quits

Recently all the vehicle stock, finished and unfinished, of the Deal Buggy Co., Jonesville, Mich., was sold to a Chicago mail order concern. The Deal Buggy Co. will doubtless sell its real estate and liquidate at an early date. The company is in good financial condition and all accounts will be paid in full.

Owensboro Wagon Co. Changes

The following changes have been made in the Owensboro (Ky.) Wagon Co.:

J. R. Miller, formerly traveling salesman for the Kentucky Wagon Mfg. Co., in Indiana and Ohio, will now cover same territory for the Owensboro Wagon Co.; R. I. Hillis, formerly traveling salesman for the Kentucky Wagon Mfg. Co., in North Carolina and South Carolina, is now in Kentucky territory for the Owensboro Wagon Co.; C. A. Newson, formerly traveling salesman for the Kentucky Wagon Mfg. Co., in Georgia and Florida, is now traveling representative for the Owensboro Wagon Co., in Tennessee territory.

F. C. Hassen, of Cincinnati, O., will be traveling representative for the Owensboro Buggy Co., in Kentucky and Tennessee territory.

President of N. I. V. A. Goes With Motor Truck Co.

A. J. Brosseau, general manager of the Gale Mfg. Co., Albion, Mich., has been elected vice-president of the Federal Motor Truck Co., of Detroit, and will become actively identified with the management of that industry.

Although Mr. Brosseau will move to Detroit, he will not sever his active connection with the Gale Mfg. Co. until July 1, the end of the company's current fiscal year. At the annual meeting then to be held the company will choose his successor, and until that date Mr. Brosseau will devote a part of his time to the business of the Gale company, spending a portion of each week at Albion.

It is understood that Mr. Brosseau will retain his interests in the company and after July 1 will continue to serve in an advisory capacity.

Mr. Brosseau for many years has been closely identified with the National Implement and Vehicle Association and at the Indianapolis convention in October last was elevated to the position of president.

Deal Buggy Plant to Make Tires

The plant of the Deal Buggy Co., at Jonesville, Mich., has been purchased by a new concern which will manufacture tires.

It is the plan to begin in a few months the manufacture of tires already on the market, and to manufacture this new invention as soon as preparations can be completed. Harris Bros., of Detroit and Chicago, have a lease of the factory which does not expire till May 1, but as much of the space in the buildings is not in use, permission to install machinery at once has been given by the present operators, who have purchased the material on hand, and are making it into buggies.

It is expected that the new factory will furnish employment for 400 or 500 men. The Deal buggy factory has been an important feature in the economic life of the village and vicinity, for a half century. It was established from small beginnings, by the late Jacob J. Deal, and reached its palmy days under the active supervision of the late George V. Deal, whose untimely death removed a master mind from the industry. For a number of years, the plant has been run with a constantly diminishing force of employes. During 1915 the plant closed down and was reopened by the Harris brothers, who are employing about 40 workmen.

Will Double Output

The Bimel Spoke & Auto Wheel Co., Portland, Ind., makers of automobile, heavy truck and trailer artillery wheels, are just moving into a new addition, which will practically double their output for the coming season. They are expending something over \$25,000 in this, and are making their shops separate, building the heavy wheels in one shop and the light wheels in a special shop, enabling a great deal larger production in both lines. The business last year was 282 per cent. larger than any year before that, and under these new buildings are making arrangements so it can easily be doubled again if necessary.

Fire Destroys Big Warehouse

The warehouse of the A. A. Cooper Wagon and Buggy Co., at Dubuque, Ia., was destroyed by fire February 11. The loss is \$300,000. It is said that most of the wagons were built on war orders.

WANTS

Help and situation wanted advertisements, 1 cent a word; all other advertisements in this department, 5 cents a word; initials and figures count as words. Minimum price, 30 cents for each advertisement.

PATENTS

Patents—H. W. T. Jenner, patent attorney and mechanical expert, 606 F St., Washington, D. C. Established 1883. I make a free examination and report if a patent can be had and exactly what it will cost. Send for circular.

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Just a Sketch of Its Contents

The list of the **WHOLESALE** and **JOBGING TRADE** is so arranged as to make it convenient to separate the association members from those not so recognized.

The **RETAIL HARNESS MAKERS** of the United States and Canada comprise the principal part of the Directory, arranged by State, Town and County, and in the large cities, the street and number is given. Those rating (approximately) over \$1,000 are marked.

A list of **HARNESS DEALERS** as distinguished from retail harness manufacturers, is also given. The value of this list to those who solicit the vehicle, implement, hardware and department stores will be readily appreciated.

A list is also published of **Export Commission Merchants**, giving the class of merchandise they handle.

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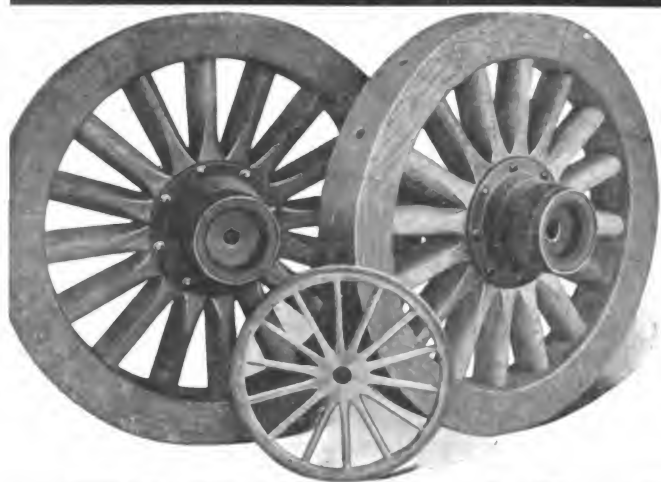
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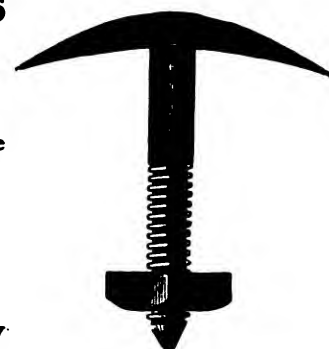
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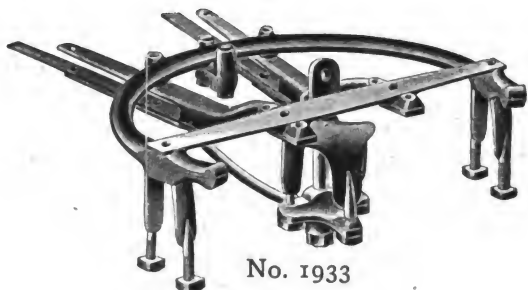
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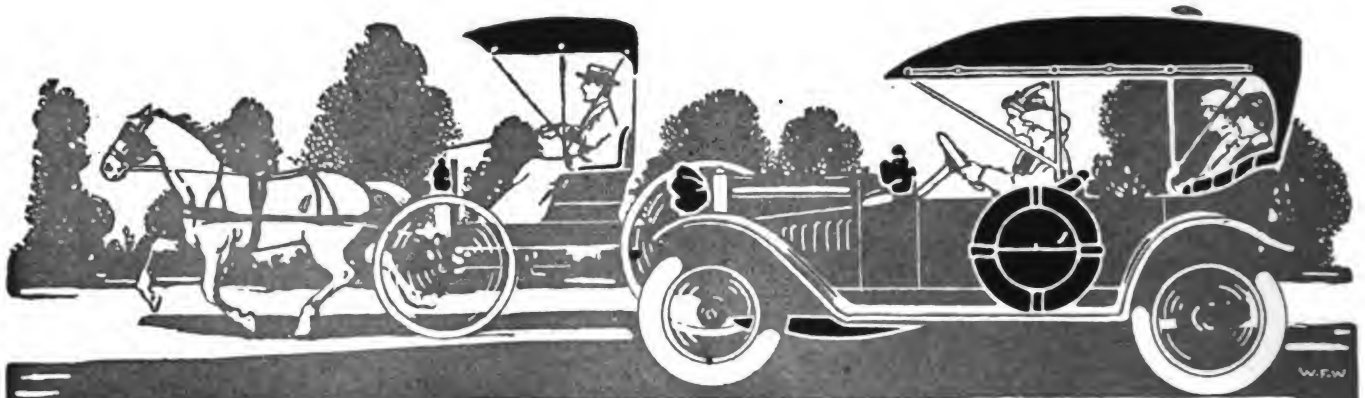
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The Hub

Vol. LVII

MARCH, 1916

No. 12

Published Monthly by

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For advertising rates, apply to the Publishers. Advertisements must be acceptable in every respect. Copy for new advertisements must be received by the 25th of the preceding month, and requests to alter or discontinue advertisements must be received before the 12th day of the preceding month to insure attention in the following number. All communications must be accompanied by the full name and address of writer.

FOREIGN REPRESENTATIVES:

FRANCE—L. Dupont, publisher of *Le Guide des Carrossiers*, 78 Rue Boissiere, Paris. Subscription price, 15 francs, postpaid.

GERMANY—Gustave Miesen, Bohn a Rh. Subscription price, 12 marks, postpaid.

ENGLAND—Thomas Mattison, "Floriana," Hillside avenue, Bitterne Park, Southampton. Subscription price, 12 shillings, postpaid.

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Price of Gasoline

The all-absorbing proposition confronting motor truck makers today is the price of gasoline. The suggestion of an export tax is out of the question as export taxes are unconstitutional.

It has always been said that it was possible to manufacture a carbureter that would vaporize heavier petroleum products. This would certainly be a welcome relief, but the automobile engineers have yet to fulfil our hopes. It is, however, in these two directions that we must look for relief—on the one hand, improved processes, which will mean a still larger yield from the crude; on the other, improved carbureters, which will bring about the proper vaporization of heavier products.

In this issue of The Hub appears an article of E. S. Foljambe on this subject, read before the Society of Automobile Engineers. His calculations, based on government figures, show that unless remedies are applied within a few years it will be impossible to supply the gasoline necessary for the automobile industry.

But serious as this matter may seem at the present moment the inventive ingenuity of the American engineer may be depended on to solve the problem.

Prefer to Take Chances

In summarizing the steel situation the Pittsburgh correspondent of the Iron Age says that for the first time since the runaway steel market started advices from several of the larger steel mills indicate that "consumers are showing a disposition to hold off from placing contracts for delivery this year and early next year, stating that they prefer to take chances on prices, and also on deliveries, when the time comes that the material should be needed. It seems that prices can hardly go much higher than they are now, and should peace negotiations start, a readjustment of the entire steel market would likely take place."

Pig Iron Production

Pig iron production in the United States in 1915 is officially reported at 29,916,213 gross tons, according well with the estimate of 29,900,000 tons made in a review at the beginning of this year. The year's output fell 3.4 per cent short of the output in the banner year 1913, 30,966,152 tons, but the output in the second half of 1915, 17,682,422 tons, broke the record for a half year, 16,488,602 tons, in the first half of 1913, by 7.3 per cent. The present indications are that 1916 will show an output close to if not quite 40,000,000 tons, which would break the calendar year record by 29 per cent.

Grant Tire Decision

On March 17 the Circuit Court of Appeals, sitting in New York City, handed down a decision against the Diamond Rubber Co., of New York, in favor of the Kelly-Springfield Tire Co., and unanimously affirmed the decision of the lower court, awarding Kelly-Springfield approximately \$210,000 damages against the defendant for infringement of the Grant patent.

This is the patent covering the internal wire Kelly-Springfield solid rubber tire. It expired February 18, 1913. The litigation has extended over a period of 20 years. The first suit was decided in December, 1898, in favor of the patent, by the Federal Court in New York City.

In 1901, Judge Wing, in Cincinnati, also found the patent valid; but the Court of Appeals for that circuit reversed the lower court and found the patent void. The Supreme Court refused to take the case on appeal; thus the patent stood valid in the east and void in the middle west.

The question of validity was before the court in Milwaukee in 1906, and the patent was there held valid, notwithstanding the decision against it by the Circuit Court of Appeals in Cincinnati. In the same year, the trial court in New York again declared the patent valid and, finally, the Circuit Court of Appeals in New York and

in Milwaukee affirmed the decision of the lower courts.

The Diamond Rubber Co., of New York, was sued in June, 1907, and the merits of the patent came before the court on ten different occasions in this suit and each time was decided in favor of the patent.

Because of conflicting decision, the Supreme Court allowed an appeal in the Diamond case, and in 1911 supported the contention of plaintiffs, declared the patent valid and the defendant to infringe. The defendant then refused to pay on the ground that it had made no profits and that plaintiffs had sustained no damages.

The accounting proceeded at great length and the master finally reported that plaintiffs were entitled to 5 cents a pound on all rubber that the defendant had sold.

An application then was made to increase these damages and for the allowance of interest. Judge Hand, sitting in the District Court of New York, allowed \$50,000 smart money and \$27,000 interest, which, together with costs, resulted in a judgment against the defendant for approximately \$210,000.

Numerous other alleged infringers have been prosecuted and several suits are now pending in the accounting stage. In one against the Republic Rubber Co., Youngstown, O., the master has awarded the plaintiffs \$115,000, being at the rate of 5 cents a pound. In a case against the Goodrich company an award has been made on the same basis, amounting to \$262,000 in favor of the Kelly-Springfield company.

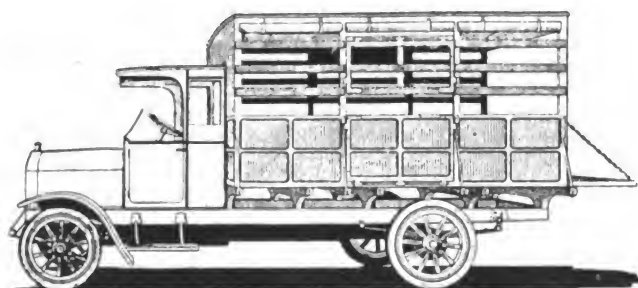
The decision just handed down is particularly important to patentees, as it firmly establishes a new measure of damages in this class of cases; or, rather, firmly establishes an old measure of damages that had been hesitatingly advanced and had practically been discarded.

Formerly, a successful plaintiff in a patent case was limited either to the profits made by defendant or to such damages as could be distinctly shown, measured by license fees, loss of sales or formed diminution of price.

The measure of damages invoked by plaintiffs in the Diamond case was that a uniform license fee had been established; and also that they were entitled to recover what was reasonable as a royalty.

Heavy Delivery Van, With Skeleton Top and Hinged Center Portion

The lower part of the body has paneled sides with outside framing, two corner and two side pillars being continued upward to carry the roof. The upper portion is



slatted at the sides, and paneled in the front. The central portion of both upper and lower parts of the body are made to hinge, the lower one downward and the upper one from the top rail. The body is strengthened by four shorestuffs each side, the end ones passing through the bearers, which are lengthened for the purpose, and the two central ones through the bolsters provided for that

purpose. The slats are laid on outside, checked in slightly, and bolted to the pillars. Waterproof curtains are provided for protecting the load in wet weather. The principal dimensions are as follows: Wheelbase, 12 ft. 9 in.; wheelbase behind dash, 10 ft. 6 in.; height of chassis from ground, 2 ft. 9 in.; length of cab overall, 3 ft. 6 in.; length of main portion of body overall, 11 ft. 6 in.; width, 6 ft.; height of paneled sides, 2 ft. 6 in.; height, overall, 6 ft.; width of frame, 3 ft. 6 in.

Studebaker Boosts Output

Additions to the Studebaker Corporation plant at Detroit, involving an expenditure of \$1,000,000 for buildings and equipment, are now practically completed. It means that production will soon be increased to at least 400 cars a day, instead of 300 as now, and that this year's output will probably be 100,000 cars.

Extensions to the plant consist of a new building for the manufacturing of heavy forgings, such as six-throw crank shafts and front axles; a three-story warehouse, 52 x 335 ft., with accommodations for 150 carloads of raw material; a three-story addition to the main manufacturing plant, adding 35,000 sq. ft. of floor space, to be used for wheel, chassis, painting and assembly; seven large double chambered furnaces to replace smaller types in the heat treating and carbonizing departments; seven forging machines for making gear blanks are being added, also two additional 500 h.p. water tube boilers; a 2,000 h.p. low pressure turbine generator is being added to be operated by exhaust steam available from the forge plant. In the manufacturing department 75 pieces of equipment are also being added to take care of six-cylinder engine parts.

Ford Additions to Branch Factories

On February 15 ground was broken at Columbus, O., for a four-story addition to the Ford branch factory in that city. This new building will add 12,800 sq. ft. of floor space to the present plant, making a total area for the enlarged factory of 163,000 sq. ft.

The addition will cost about \$150,000. At the present time 200 men are employed in the Columbus plant, which, when the new addition is completed, will have a capacity of 100 cars a day.

Additions were begun March 1 to the Denver, Colo., factory, where a second four-story building is also to be erected. The new structure will add 12,500 sq. ft. to the present plant, making a total floor space of 187,500 sq. ft. The new addition will cost about \$175,000. The Denver factory has about 275 on its payroll at this time and its enlarged assembling capacity will be about 100 cars a day.

Aluminum Production in the United States

Aluminum production in the United States totaled 80 million pounds last year, against 15 million pounds in 1906 and only 83 pounds in 1883. This year's output may reach 100 million pounds, or about half the world's production.

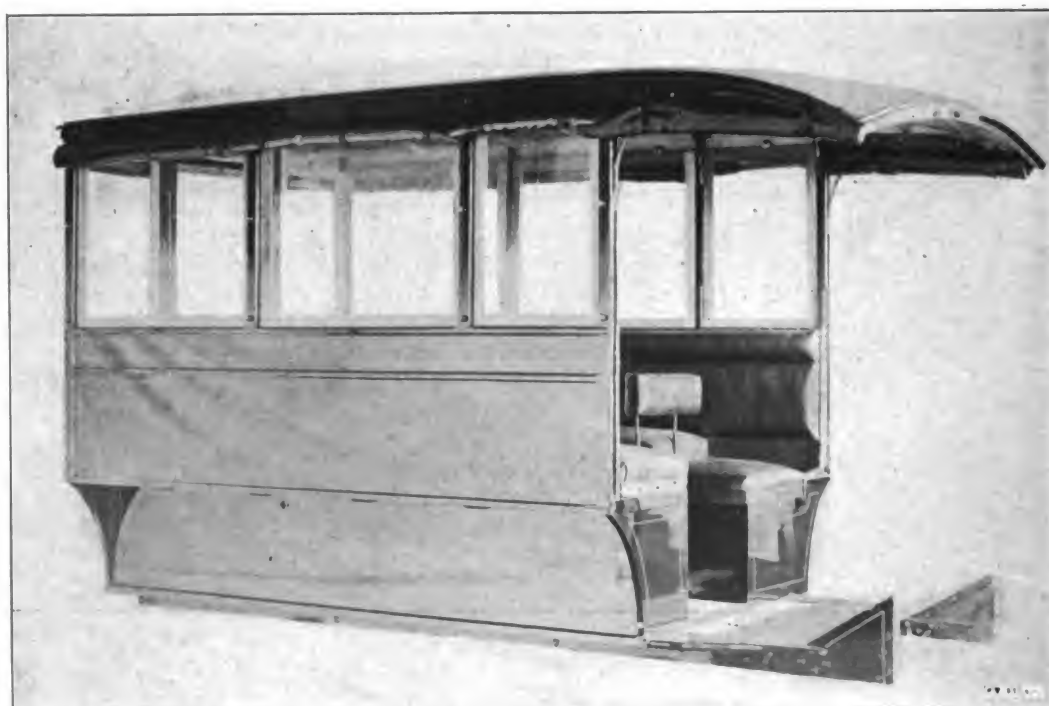
Owing to the shortage of rubber in Germany, it is stated, on the authority of the managing director of a large rubber company who returned a few days ago from Berlin to Stockholm, that nearly all the taxicabs in Berlin have steel tires, and that steel tires are also in use on cars at the front.



JEFFREY FRONT AND REAR ENTRANCE BUS



TYPE OF PACKARD BUS

**AUTO CAR BUS****YORK WAGON GEAR CO.'S BUS BODY**

Anti-friction Metals

A Few Notes on Their Structure, Behavior, and Value

If it were not for the results of friction, metals which were prevented from corrosion and kept free from fracturing shocks would be practically everlasting. Attempts which have proved very successful have therefore been made to resist the customary effects produced by the continuous rubbing and pressing together of metals which constitute the working parts of light cars, to which, of course, I am now confining my attention, writes James Scott, in an English publication.

The two main factors which deserve consideration at present are those known as "shear" and "seize." When, for instance, two ungreased panes of glass are laid with their two opposite surfaces in contact together, and one is pushed over and along the other, a moment soon arrives when it becomes impossible to continue the sliding movement. This difficulty, which also occurs in connection with smooth metals when insufficiently lubricated, is known as "shear."

Metal fittings which have become slightly worn through use or weakness and are consequently rough may cause

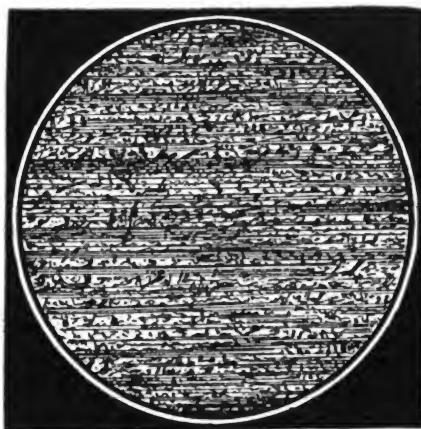
A typical babbitt metal contains 88.9 per cent of tin, 7.4 per cent of antimony, and 3.7 per cent of copper. A very capable improvement on this alloy, for particular purposes, has 86 per cent of tin, 8 per cent of antimony, and 6 per cent of copper. Over 83 per cent of tin is present in one of the best and most widely used metals of this kind.

If too much antimony is present the metal will have an unwelcome brittleness, and be likely to break up, and by scattering into separate hard particles cause more harm than good. Tin counteracts to a considerable extent this brittle tendency of antimony. If, however, in the remelting process the tin should be heated too strongly, some of it may oxidize; and as the oxidize—which is a refractory white powder—is very hard, it would by scratching, and acting otherwise as grit, spoil the metal.

These metals are considerably roughened when a small proportion of copper is added to them. It is strange what great differences are made by apparently trifling amounts of various ingredients. When metals are melted together some of them unite indistinguishably to form a distinct compound, the characters and properties of which differ



A magnified view of the structure of a fine-grained anti-friction metal. The crystals and grains are soft



A magnified view of the anti-friction metal shown in the first view after a broad-pointed pin had been pressed across it, thus re-shaping its particles in furrows



A magnified view of a coarse-grained anti-friction metal

their opposing, projecting particles to grasp one another or hitch together, the defect being called "seize."

Now there are bearings and other mechanical parts in all cars which it is either difficult or impossible to reach satisfactorily for the purpose of oiling them. This fact has led to the introduction of what are termed anti-friction metals.

These metals are alloys, and are known in a general way as white metals, and in a more restricted sense as babbitt metals. Some of them are particularized as magnolia, glacier, and standard metals. Their composition varies slightly, but they are all soft, glossy, and silvery in color.

The anti-friction metals are composed mainly of tin, antimony, copper, lead, and zinc. Tin, being soft and malleable, is of exceptional value. Antimony has the curious and useful property of expanding as it cools from the molten condition, and it is comparatively hard. Copper is soft and yielding, yet very tough. Lead is too plastic to be used to a great extent. Zinc has certain merits, but does not mix very well with some of the other ingredients.

considerably from those appertaining to either of the members when in a separate condition. Such intimate fusion is known as the eutectic, on account of solidification of the particles occurring together. But, as a rule, perfection of this nature is not entirely present, although it may constitute the main mass of an alloy, and serve as a matrix for the particles of the others. Usually, there are grains of unaltered metals scattered throughout the remainder, and these may have a very important and far-reaching influence on the substance in relation to its frictional responses.

Different metals have different melting points, and therefore, some of them become plastic at temperatures which do not affect others in the same way. The behavior of a metal may alter, however, in this respect when it is alloyed with another kind, but it is seldom that such substances become wholly converted by combination. When a mixture of several metals is reduced to a molten state, stirred, and then allowed to cool there may be so much excess of one beyond the others that it becomes practically isolated, and the result is that it crystallizes out between the particles of completely amalgamated material.

The art of alloying depends on the proper selection of the percentages of the various ingredients.

Anti-friction metals are often poured into recesses which have been left in bearings composed of hard metal during the casting of the latter. They may take the form of long strips, or diagonal shapes. In these cases there is left an upstanding or "proud" surface of the white alloy, and this is properly tooled to conform with the design needed.

In other cases, where the wearing effects are not likely to be severe, the anti-friction metal itself is cast into form.

Microscopical investigation of anti-friction metals soon explains why they are meritorious. On the left is depicted the unpolished surface of a fine grained kind. There are minute glistening crystals and irregular nodules. These are very brilliant, and can be prodded about as though they were dough by means of a broad pin point. To the naked eye none of this behavior can be seen, but it is important. In the center the result can be seen. Friction of a similar or another kind of metal against this surface simply rubs the grains and crystals together so that they reform accordingly without losing their cohesiveness.

On the right is shown a somewhat coarser anti-friction metal, made for heavier use. It behaves like the former, but is hardened by suitable constituents.

Rise in Cost of Car Manufacture

An increase of \$100 in the price of the Chalmers Six-40 touring car, from \$1,350 to \$1,450, effective March 1, was the announcement made during the recent Chicago Automobile Show by executives of the Chalmers Motor Co.

"Raw materials have advanced in price to new high levels in the past few months, and the end is not yet in sight," said Hugh Chalmers. "We have found it impossible to manufacture a car conforming to our standards of quality at anywhere near the former production costs. Rather than sacrifice quality or cheapen our product in any way, we have decided to advance the car's price.

"I predict a general upward revision of motor car prices all along the line before many months. There is no other way out for the automobile manufacturer.

"The European war has been responsible, in a great degree, for the big increase in the costs of raw materials. The tremendous demand for steel, copper, tin, lead, aluminum, sheet metals, and other materials for use in the manufacture of war munitions has made prices high and deliveries uncertain.

"Vanadium steel, which sold at \$1.85 a pound only a year ago, has jumped to \$8.50 a pound. Aluminum has nearly tripled in price, going from 19 cents a pound to 53 cents a pound. Other sensational increases are: Steel bars, from \$1.10 a hundred to \$2 a hundred; high speed steel, from \$1.05 a pound to \$3.35; leather from 20 cents a foot to 33 cents a foot; copper, from 14 cents a pound to 24 cents a pound.

"Added to the many troubles of the motor car maker is the difficulty in securing machine tools and automatic machinery of the latest type. Factories turning out shrapnel and other munitions of war have practically corralled the output of the machinery makers.

"Steel mills are making no promises of delivery within the six months period, and parts manufacturers are accordingly held up in their production. Almost every concern in the metal industry is turning down orders, having accu-

mulated a quantity sufficient to keep them at top speed for months to come.

"The situation can result in only one thing—higher prices on cars within the next 60 days. If we find that materials continue to climb after the \$100 increase in price on our car has taken effect, we will undoubtedly be compelled to again raise the price. We have as yet, made no change in the price of the Chalmers Six-30 model, now selling at \$1,050, because this car is being built from materials purchased last spring."

Buggies in Demand in Iowa

Buggies are "coming back" in Iowa. That is the testimony of many travelers and dealers. These are busy buggy days, they say, and something like old times in the vehicle business. A case in point is that of H. S. Cline, dealer at Hedrick, who recently had an auction sale to dispose of a stock of implements which he had bought up at Woodward. There were no buggies in the stock and to make the sale more attractive he secured 15 buggies to offer along with the implements. The buggies went better than anything else he had to offer. He sold all 15 of them and his profit on them was over \$300. Travelers claim that the buggy business is going to surprise manufacturers and that they will be unable to fill all the orders they will receive.

As to Henry Ford

H. H. Nimmo, a Detroit publisher, says of Henry Ford, whom he has known for a long time: "It is, we believe, a fair estimate of the man to say that he is a mechanical genius of a sweet and lovable disposition with almost boundless ignorance on almost every subject of human knowledge outside of his mechanical specialties. He never had the advantage of an adequate education at school or college, and he has succeeded in reaching middle life with far less of the fruits of self-education than many men of the same age with less opportunities. He has read less than the average schoolboy. He would never win a prize in spelling, and what he says so frequently and so verbosely in the newspapers of late months is what others say for him, and write for him, and in large measure think for him."

Steel Tires Heated by Electricity

A prominent American automobile manufacturer is using electricity to heat the steel tires of the wheels, which must be brought to a red heat before being placed on the wooden members. For this purpose the steel tires are laid in a steel tube surrounding a transformer coil which acts as the primary while the tires become the secondary of a transformer. It is said that motor truck tires, which are about 0.5 in. thick, 10 in. wide and 36 in. in diameter, are brought to red heat in about three minutes' time. Not only is the danger from fire greatly reduced by electrically heating the tires, but the method also lays claim to more uniform and rapid heating as well as the elimination of soot or oxidation.—Scientific American.

New Haven Carriage Co. Adds

The New Haven Carriage Co., New Haven, Conn., builder of automobile bodies, has begun the construction of an addition, 50 x 90 ft., two stories.

Labor Saving Bodies for Motor Trucks

Economies Obtained by Study of Operating Conditions and Developing Special Equipment Suited for the Work

Construction of motor truck bodies intended for general work seemingly does not demand ingenuity or special training, for what can be regarded as standard types—that is, platform or express—are supplied by a majority of the builders of the machines, and a buyer is justified in assuming that such equipment is designed to meet the chassis requirements, or, in other words, "to fit."

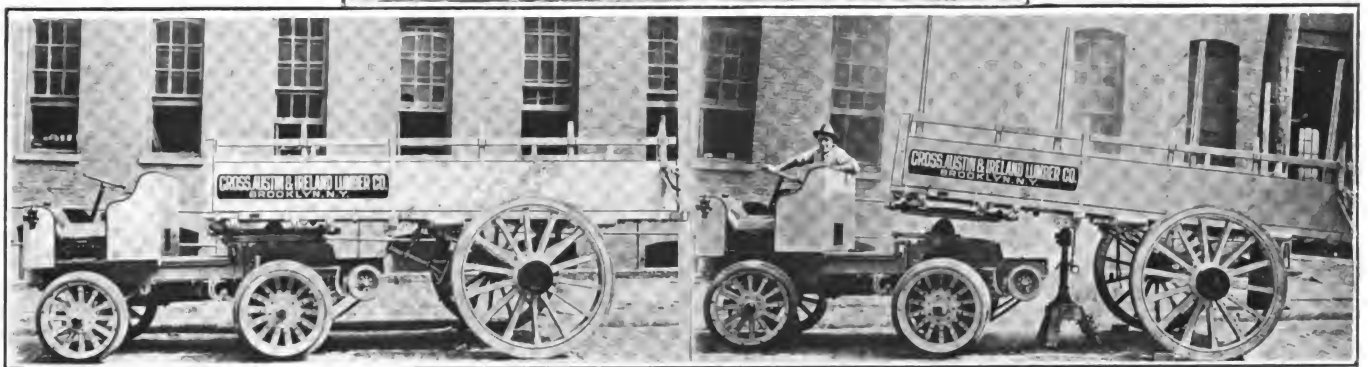
Some of the truck manufacturers prefer to sell the chassis only, because body building can only be done profitably with adequate facilities and tools and expert workers, or what may be termed a complete wood working shop, operated in connection with the factory, and as work of this character is, as a rule, done apart from the supervision of the buyer, it cannot be modified or changed save at the cost of at least delay and the expense for materials and labor.

So far as the shop is concerned, special production is expensive because the prices obtained cannot sufficiently exceed those

thoroughly equipped shop must be maintained and this placed in charge of a man who has capacity to design and construct as well as organize and direct. Another experience is that truck building is an entirely different industry from body making, and unless the two are carried on as entirely different departments there will naturally be confusion, if not conflict, of interests.

The Real Value of the Spiral Body

But if the truck builder wishes to divorce himself from all other business purposes than producing machines, he must sell the chassis and leave to the purchaser the problem of obtaining bodies that will serve the requirements. This is the general policy of all European manufacturers of trucks, but American buyers appear to believe that because what is known as a stock body is cheaper they are saving money by using them, rather than obtaining the better results from what is built purposefully for their uses.



Gasoline lumber tractor and special trailer body for short stock: At left, the equipment complete; at right, the body jacked for uncoupling; above, the trailer body in the yard in readiness for loading

charged for stock bodies to insure a reasonable profit. Not only this, the purchaser of a chassis believes that he ought to receive discounts if he orders body equipment, and cannot understand that such concessions are actually price cutting.

From one viewpoint a truck manufacturer ought to produce both body and chassis cheaper than if these were purchased separately, and this is accepted by those who have not experience, but those who have endeavored to supply bodies have found that to do this satisfactorily a

There is one large American concern that has always built the bodies used on its trucks and wagons, and it has many times refused to sell machines unless the buyer purchased equipment turned out of its own shops. Though this policy has been more or less criticised, largely by those who were not permitted to install bodies they proposed to build, there has not been an instance of the machines affording the service that was not satisfactory, nor of not enduring for the period stated.

In stating the reasons for this policy the company em-

phasizes that when it builds a vehicle it promises that it will do a stated work and that it will be practical to operate it in the service for which it is to be used. But operating economy and vehicle endurance are to a considerable degree dependent upon the weight of the load and the manner in which it is carried. The loading, if the body is built for the work, is then a matter that is directly under the supervision of the owner, who can accept the responsibility if the machine is overloaded or the freight is not distributed equally.

The machines will be sent out, however, with bodies that will be built both to fit the chassis and the requirements of the owners, and this is as far as any concern can safeguard both itself and the users of the trucks it builds.

Truck Builders Not Body Specialists

There is one factor, says Motor Truck, that is usually lost sight of by the truck buyers, and that is that the builders of machines have not as a rule the experience in designing and constructing special equipment that is the big asset of the special body makers. Without exception the concerns that were successful in producing specialized horse vehicles turned to motor truck body development, largely because their services were sought by purchasers of machines who previously dealt with them, and who realized that practical knowledge in horse vehicle building could be equally well applied to power trucks.

Cost is regarded differently by men, some of whom place one price against the other without much regard for quality, while others consider what they obtain for the difference in cost—that is, measuring the assumed greater value by the cost. This is a method of judging that can be well applied to vehicle bodies, and while there is undoubtedly a difference in initial cost, the economy of operating expense, which is undeniably the principal result, with the probability of greater endurance, when carried through the life of the machine much more than offsets the added price.

Those who are engaged in business that requires heavy freightage are becoming more and more impressed with the advantages of using the motor truck in much the same manner as animals are now used—that is, to use the machines for haulage and carrying a part of the load, and utilizing the power to a far greater degree than

is possible or practical with the single truck. Power is necessary to obtain speed, but as the speed is reduced the power can be in like ratio used for hauling. By this is meant that a truck ought to have at least double the capacity when used with a semi-trailer, and the tractor ought to have power to haul from three or four times the load that would be carried on a truck having the same engine rating. But speed must be lost sight of and size of freight considered.

Speaking literally, a tractor is a machine that is used for drawing, but not for carrying loads, and there is no word that precisely defines the truck or tractor, so-called, that partly carries and hauls a load. Considering the truck that is used with what is known as a semi-trailer, this has a longer wheelbase than what is known purely as a tractor, and it may be so equipped that the coupling for the semi-trailer may be removed, a body installed, and used for carrying freights. The advantage of this form of equipment is apparent.

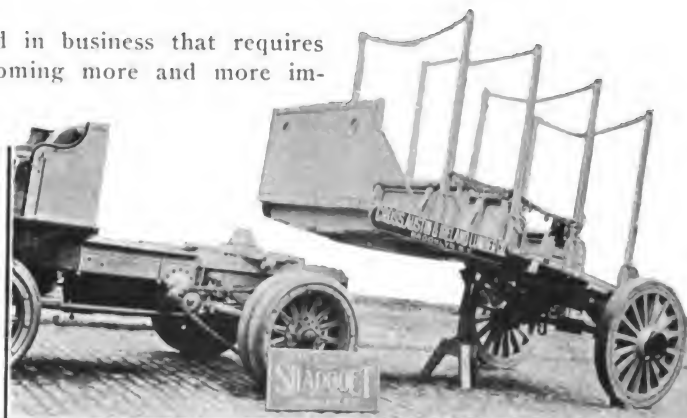
Tractor Can Only Be Used as Such

The tractor, however, can only be used with trailers or a semi-trailer, and it cannot be converted to other uses, but it will probably have greater capacity for haulage than the other. Each then has its own particular advantages, and one will note that special body equipment for semi-trailers or trailers is necessary to obtain the greatest haulage value, just as special bodies are necessary for trucks.

Some special form of tractors driven by gasoline engines have been developed to haul heavy loads and these are all used with the semi-trailer type of bodies. These are specially interesting from the viewpoint of those who have heavy haulage to do and who desire to obtain the greatest capacity from a single unit. One of the claims made by those who have operated tractors or trucks and semi-trailers is the saving that can be made in wages, as well as operating expense.

Assuming that a five-ton truck can be operated for \$12

a day, including \$3 a day depreciation charge. A semi-trailer that will haul 10 tons can be used with the truck for practically the same cost, and the work will be increased probably 75 per cent as compared with a single truck, the lessened mileage due to the heavier loads being the reason why the work is not doubled. The truck, how-



Semi-trailer body for hauling long timber: At left, the gasoline tractor and the body coupled to it; at right, the body loaded with very long timber; above, the body elevated on a jack ready for coupling

ever, cannot be handled quite as advantageously as the shorter tractor, which will probably show a slight gain as compared with the truck.

Tractors for Hauling Large Loads

The custom of those who have freighting of this kind is to use the tractor type of construction with the large loads, principally because these machines are designed purposely for this work and are usually heavier and stronger in construction and are better adapted as a whole than are the trucks. Tractors are built with the view of the rear axle carrying practically all of the pay load, but trucks, with few exceptions, carry some of the weight of the freight on the forward axle. The short wheelbase is decidedly advantageous where the space for working is limited, and it is not at any time a disadvantage.

Several types of semi-trailers have been designed by the Shadbolt Mfg. Co., Brooklyn, N. Y., for use with tractors by the Cross, Austin & Ireland Lumber Co., of that city, for hauling lumber. The lumber company desired to obtain large capacity vehicles and preferred to carry the loads so far as possible on steel tires. Trailers were desirable from the fact that they could be loaded at the yard while the tractor was making deliveries. As the loading is necessarily done by hand, holding a truck or a tractor during the loading period would mean the loss of valuable time.

Converted Horse Equipment Not Practical

Converting horse equipment was not believed practicable because of the very heavy stresses of the loads when hauled through the streets, and that as fast speed as was possible was desired. The one of these bodies, which is illustrated, was for transporting very long timber or lumber, and the other, which is also shown, was for carrying short stock that could be piled higher. Obviously the freights would be large. Handling these in the yard would take time, because lumber must be stacked by men, and the bodies must be quickly unloaded or left at the delivery points to be hauled back to the yard when the loads had been removed by the crew or by those to whom they were delivered.

Hauling heavy loads at comparatively fast speed meant that the loads must be carried on springs to protect the trailers, and the construction must be strong and enduring. To economize time in coupling and uncoupling the bodies the trailers must be built and equipped so they could be raised or lowered quickly. The trailer bodies must be mounted on good sized wheels to minimize the power required for hauling, and the mounting must be heavy enough to endure the strain of the relatively high center of gravity of the loads when stacked to the capacity of the bodies.

Semi-trailer for Lumber Freighting

The semi-trailer designed for the loads of long timber necessarily had greater length than the other. The shorter body was built with a rectangular steel axle on which were mounted a pair of large wheels, and on the axle was installed a set of long, heavy, semi-elliptic springs. The

platform was built with a frame having a stout deck, which was fitted with flat bolsters at the rear for the spring end guides, and deeper bolsters at the forward end to carry the upper section of the Shadbolt fifth wheel, which was used for coupling to the tractor. The frame was built with numerous cross members and longitudinal sills and stringers, and fitted with the usual heavy steel brackets, bands and reinforcing braces. The deck was crowned slightly between the ends to afford greater strength.

The forward end of the trailer body carried what might be termed the dash, this being a heavy construction of wood, on the top of which was mounted a wooden roller, braced from the back with steel rods, and back of this were three similar risers or mounts, the first and third of equal height and the second the higher. At the rear end of the frame was mounted another roller, this being slightly above the deck and fitted with a ratchet controlled by an upright hand lever so that the roller could be turned



Tractor and end-discharging semi-trailer body designed for a Brooklyn, N. Y., contractor, equipped with manual hoist

forward freely, but not turned backward unless the ratchet were released. The heights of the rollers were so graduated that they would all support a timber placed on them. At either side of the platform a series of stakes were mounted in well braced steel stockets, the purpose of these being to give support to the load and prevent it moving sidewise. This was an adaptation of lumber wagon construction.

Carried Heavy Jack and Base

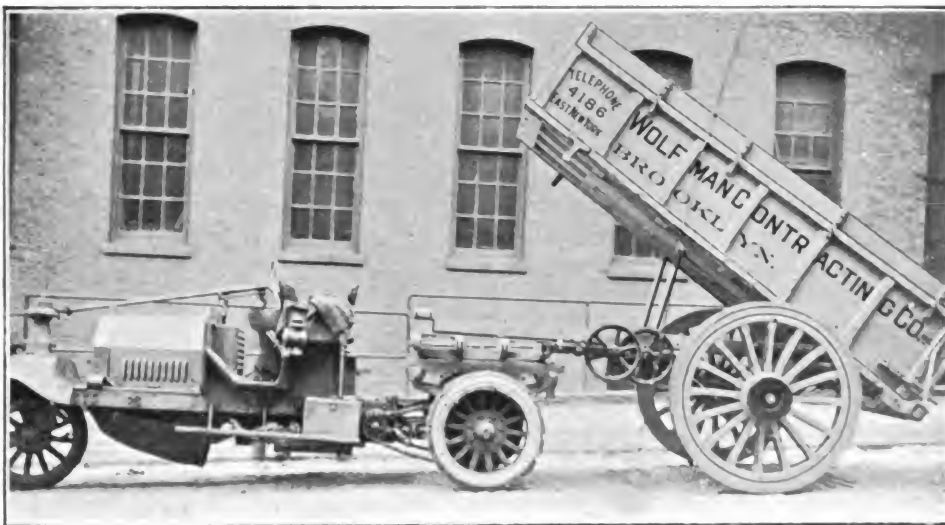
To raise and lower the forward end of the trailer body a large screw jack was provided, the base of this being mounted on what might be likened to a three-legged stool, built of heavy timber, this affording a solid support on uneven surfaces. This was arranged to be carried on the body suspended by chains, so that it could be dropped or slung quickly. With a bar lever the body and load could be lifted or lowered with comparatively little labor. The body was coupled to the tractor with the Shadbolt fifth wheel, this having transverse and longitudinal shafts and spring buffers to absorb the starting and braking stresses.

The other body, very similar in general construction, was designed for carrying very long timber, but two instead of the three mounts for the rollers were placed between the front and the rear of the platform, and in loading the timber was carried forward over the front roller.

this elevating the load well above the head of the driver, so that the tractor could be turned without interference.

Adapted for Quick Load Discharging

With either type the load was discharged by simply releasing the binding chains and the hand lever at the rear, the lumber sliding until the rear end rested on the ground, and then by starting the tractor the body was drawn ahead and the forward end of the load dropped. When loading at the yard horses were placed under the bodies to afford better support than would be obtained by the jacks alone. With the longest type of body a jack was used only at the yard, and two struts or legs, adjustable in vertical guides, which could be secured by hook-ended rods engaging with pins in the struts, were fitted. These struts were used instead of a horse and could be easily raised or lowered and adjusted for length to support the body when it had been lifted from the tractor by the jack.



The end-discharging semi-trailer body elevated, showing the adaptation of the manually-operated hoist

These bodies are in constant use and have given entire satisfaction from the viewpoint of quick haulage, for they can be unloaded practically by gravity, the construction is not costly when its service value is considered, and the different bodies can be used with a single tractor. The time required for loading is not a factor governing the utility of the machine. Long and short hauls can be made as conditions require, and the trailers may be left at delivery points for unloading without loss of time. The company used two types of tractors, the one with the jackshaft forward of the rear axle and the other with the jackshaft mounted at the extreme rear end of the chassis, back of the wheels, the driving chains being forward of the jackshaft. This construction gives a very short wheelbase, which is desirable in working the machine where the space in the yard and at the places of delivery are small.

End Discharging Trailer Body

A type of end discharging, manually hoisted body was also built by the Shadbolt company for the Wolfman Contracting Co., of Brooklyn, which is used with a Martin tractor. This body is carried on a heavy frame, that is supported on semi-elliptic springs mounted on dead rear axle equipped with large steel tired wheels. The forward end of the body and the rear of the chassis frame are equipped with the Shadbolt fifth wheel. The frame of the body rests nearly its entire length on the main frame,

there being two long hinges at the rear. Vertical guides at the forward end of the body that drop below the level of the frame prevent any transverse movement.

The hoist consists of two struts that are pivoted to the body frame, there being chains from the lower ends of the struts to a shaft installed transversely on the main frame. This shaft is turned by a train of gears operated by a crank moved by hand, and is retained by a ratchet. The body can be elevated to any desired height, in comparatively quick time and with little labor. When the body is lowered the struts hang vertically ahead of the wheels, and because they are free to swing on their pivots they cannot be damaged by contacting with road obstructions. This equipment is extremely practical and the cost is low when the utility of the body is considered.

Need for Motor Testing

At the regular February meeting of the Metropolitan Section, Society of Automobile Engineers, held at the Automobile Club of America, in New York City, February 25, Leonard Kebler, president of the Ward Leonard Electric Co., was elected chairman; Harry Tipper, advertising manager Texas Co., secretary, and H. G. McComb, engineer the General Vehicle Co., treasurer.

The program for the evening included a symposium on motor testing and was provocative of a valuable discussion on the real needs of testing commercially. The topic was introduced by Peter Payne Dean, former engineer of the Diehl Mfg. Co., who took the viewpoint that it is not necessary to secure horsepower

readings at the rear wheels.

This viewpoint was discussed by C. F. Scott, engineer of the Sprague Electric Works, and others. The net result of the discussion seemed to be that some form of testing is necessary, but there was evidently a disagreement among the members present as to whether or not the expense of the dynamometer equipment is justified.

In bringing forward his arguments Mr. Dean stated that in his opinion the blower system fits the situation best of all, assuming, of course, that the accurate horsepower at the rear wheels is not to be measured accurately. The movement of the air in absorbing power does not create heat and furthermore the installation is not expensive. The air can be used to cool the radiator and thus simulate the actual conditions of running the car. In a modern installation, a series of multivane or paddle-wheel blowers are installed either in the test room ceiling or underneath the floor. They can be either driven through friction drums or by belt. This installation is now in use at the Chevrolet plant.

Mr. Dean stated that on comparing costs he finds that the electric dynamometer system to absorb 25 h.p. would cost \$800 per set, while the blower system for the same power output could be installed for \$300 per set.

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High Price of Gasoline and Automobile Situation

By E. S. Foljambe*

Introductory remarks as to the seriousness of the present fuel situation are unnecessary. The conditions are apparent to all. At the present time gasoline is selling retail for five cents more than it has ever before sold in its history as an automobile fuel. The automobile industry is being seriously affected. A recent canvass of the garages in certain of the large cities established the astonishing fact that from 30 to 50 per cent of the pleasure cars are standing idle in the garages. This, of course, is partly due to the season of the year, but is in great measure a result of the unprecedented price of gasoline.

A general view of the situation leads to the belief that gasoline will go much higher before it again drops. That it will again drop is probable, but not to the point to which automobilists are accustomed. There is every indication that the price will continue to rise during the war and may even reach a prohibitive point if legislation, greatly increased production and the use of lower grade fuels do not become actualities.

Effect Upon the Industry

That a price of 30 to 50 cents a gallon for gasoline will seriously affect the automobile industry is not questioned. Indeed, it is already seriously affecting the sale of cars. With commercial cars the cost of fuel is even a more serious item, and the present price is making itself felt appreciably in the total cost of delivery. Many merchants who have been converted to the advantages of motor-driven vehicles are now questioning the advisability of purchasing until the fuel situation is settled.

It is time that the automobile industry, not only the manufacturers but the dealers, the garage men, the clubs and the individual owners investigate this matter most seriously with a view to changing present conditions, either by new designs or legislation or both, if such seems within their power.

The United States Bureau of Mines places the value of the petroleum waste at not less than \$50,000,000 a year. A considerable part of this waste is preventable, as it is due largely to evaporation. The waste begins at the wells, where the natural gas escapes instead of being utilized; in field storage the oil evaporates and also deteriorates, in the pipe lines some is lost through leakage, and in refining from three to five per cent is figured as a loss. Better and more economical methods may be devised, and it is time that these losses be looked into with serious intent and prevented as far as possible.

Data on Gasoline Consumption

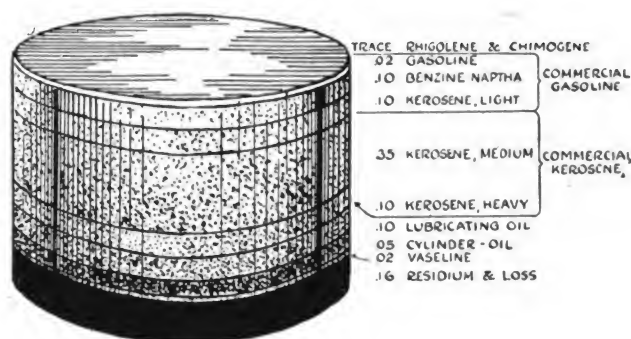
But let us look for a moment at the consumption of gasoline. The government figures give the production in 1904 as 34,915,000 barrels, 5,000,000 being exported, leaving 29,915,000 consumed. In 1915 the production increased to 41,600,000, of which 6,500,000 were exported. This enormous increase in exportation of 1,500,000 over the preceding year is, of course, due to the war. This leaves 35,100,000 as the amount consumed. If the automobile industry continues to grow at anything like the rate now probable there will be at the end of 1916 approximately 3,000,000 vehicles in use. A conservative estimate of the consumption of these vehicles is 14 barrels

a year, which would make 42,000,000 as the probable consumption of the automobile industry alone this coming year. But stationary engines, farm tractors, motor boats and all types of internal combustion engines are also increasing. Assuming the automobile industry consumes two-thirds of the total output, the total demand on the producers for gasoline will be approximately 63,000,000 barrels per annum. Even basing our calculations on this demand remaining the same, the available supply of 934,000,000 barrels which can be produced from the sources now known, would not last 15 years.

The paramount importance therefore cannot be overestimated of legislation to prevent increased exportations at high prices, of increasing the production of gasoline from the crude by improved methods, of designing smaller engines that will be more economical, and for immediate relief of the development of carbureters and the reconstruction of engines and manifolds, which will make possible the use of low grade fuels.

Alcohol Offers No Relief at Present

At this critical situation it is natural to turn to a substance that can be produced in unlimited quantities, that cannot be controlled by any group of manufacturers and the source of supply of which is cheap and plentiful. Alcohol is such a fuel. Unfortunately, even if there were



Graphical suggestion of the percentages of various oils in the crude product

no governmental restrictions concerning its production, it offers no present relief, owing to the fact that for economical use an entire reconstruction of automobile engines would be necessary. Instead of 65 to 70 pounds compression, for efficient alcohol burning, 100 to 175 pounds are required. This at once eliminates it as a fuel for the 2,000,000 vehicles already in use. Under extreme stress and provided the laws were changed new engines could be produced that would show practically as efficient a performance with alcohol as with gasoline, the horsepower being less in proportion as the thermal units per pound of alcohol are less than in gasoline. Even present type engines can burn alcohol, but do it wastefully, the consumption per horsepower hour being approximately 50 per cent more than if designed for using alcohol. Under these conditions alcohol will undoubtedly not enter as an automobile fuel until gasoline, mixtures of gasoline and kerosene or even the lower grade fuels are either prohibitive in price or exhausted.

Benzol a Fuel Possibility

The prevalent use of benzol in Europe as a motor fuel has led some to expect relief from this source. This hydrocarbon, which is a by-product of coke, although slightly less volatile than even gasoline of the low grade now in

*Extract of paper read before Metropolitan Section of S. A. E.

use, nevertheless serves well as a motor car fuel, it being possible to start on it with the ordinary carbureter and to use it as gasoline is used without any difficult adjustments. Benzol, however, can be obtained in this country only in limited quantities. There is no general or present means of distribution as exists with gasoline or as would exist with kerosene if it were used as a common motor car fuel.

Approximately 14,000,000 gallons of benzol were produced in coke ovens in the United States in 1915, with a probable output for 1916 of 22,000,000 gallons. Unfortunately this possible fuel is selling at the present time for 75 cents a gallon and not lower than 65 cents in 1,000 gallon lots and is in ever increasing demand in the manufacture of dyes, explosives and carbolic acid.

A ton of coal now yields by the present processes about two gallons of benzol. The amount of coal used for coke manufacture now averages about 70,000,000 tons annually, which means a possible annual production of benzol of approximately 3,000,000 barrels. Although there is almost an unlimited supply of coal available benzol would have to be in general use as a fuel for some time before it would be manufactured for fuel purposes as a by-product of the coke industry. As long as the war continues benzol is in as great demand as gasoline, and, therefore, offers no relief. However, as it can be produced to sell for even less than gasoline is selling for at the present time and did sell at such prices but a few years ago, it may be considered as a possible future source of part of the fuel supply.

Only Prospect of Immediate Relief

As gasoline cannot be produced without producing kerosene, the unprecedented demand for gasoline has caused an overproduction of kerosene. At present kerosene is being stored in vast quantities, and means for disposing of it are being sought by the refiners, as shown by advertising campaigns on kerosene with special trade names. During the Boston Show such a campaign occupied full pages in the daily papers. What is known as "commercial gasoline" contains 10 per cent of benzine, naphtha, and 10 per cent of light kerosene.

Much to the sorrow of the automobiling public and of truck users, the oil companies gradually have been supplying as part of commercial gasoline even a part of the heavier kerosene, so that the industry has been forced even while burning gasoline to provide suitable carbureters and heating devices to handle this mongrel fuel, which, instead of showing 72 to 76 degrees test, is often as low as 54. Practically none of it is more than 60. Commercial kerosene contains 35 per cent of medium and 10 per cent of heavy kerosene.

More Gasoline by Rittman Process

The Rittman process, the most recently discovered method of fractional distillation, is said to yield 200 per cent more gasoline than any other known method. It is technically spoken of as a cracking process, which is a breaking or splitting of the oil into its various compounds. There are at the present time seven plants in the United States using the Rittman process. The total output of these is not yet sufficient to cause any appreciable price or production change in the market. However, as this process has been made public and yields greater returns from a given quantity of crude, there is

every reason to believe that it will offer some relief in the near future.

We have now reached the point where the less volatile products must be used for fuel. This means that low grade fuel carbureters must be devised and the engine so modified that they will burn this fuel.

It may be said, "What is the use of using kerosene? The manufacturers will merely boost the price if it is in greater demand." This, of course, is true, to a certain extent, but it is certain also that if both gasoline and kerosene are in use as fuels the mass of the motoring public will turn to the cheaper fuel, thereby increasing the demand for it and decreasing the demand for the higher priced fuel. This, to a partial degree, makes an automatic check on the price. In other words, with both in demand, neither one is as likely to reach a prohibitive figure.

Problems in Using Kerosene

Many experiments have been made to determine the possibilities of using low grade fuels. Nearly all of these have shown that they can be used under proper conditions, but it is difficult for the ordinary automobile user to get satisfactory results from non-volatile fuels. Clogging up or loading up takes place whenever the engine is too cold, due perhaps to coasting or to the engine having stood for some time. When the engine is throttled the fuel seems to condense, load up the intake pipe and occasionally flow back into the carbureter. When the throttle is then opened this excess fuel is drawn into the cylinders, as shown by clouds of smoke, and results in carbonization.

The difficulty of starting the engine is perhaps one of the greatest. This requires gasoline or the use of some outside heating device to vaporize the fuel. These seem to be the only alternatives, with the one exception of some device that actually ignites the fuel while in the carbureter.

Tests by P. S. Tice show that a starting mixture temperature ranging from 170 to 250 deg. F., depending upon the richness of the mixture, is necessary with kerosene, the higher temperatures being required for the leaner mixtures. These tests also indicate that the fuel consumption decreases as the temperature increases up to 160 deg. F. for the running temperature of the mixture itself, and, furthermore, that steady running cannot be obtained with a mixture temperature of less than 100 deg. Fahr.

The results of such tests indicate the possibility of starting direct on kerosene, provided makers are willing to devise and provide the public with suitable vaporizing mechanisms. The electric lighting and starting, which is a part of the equipment of every high grade machine today, gives a ready means of obtaining sufficient electric current for such purposes. However, in spite of these facts, I do not know of any car now being offered that makes possible the use of kerosene. If such vaporizing devices are installed they must be automatic.

Thermostatic Control of Heating Coil

The objection that such a construction would complicate the design is more or less invalid, as makers have shown no hesitancy in adopting devices that better performance even when they complicate the design. To make such a vaporizer automatic and to take care of all conditions that may arise, under which the special heat-

ing of the carbureter will be necessary, some form of thermostat must be installed to care for the switch operation. Thermostats are now in use on eight and twelve-cylinder engines to control the water circulation. These give practically no trouble; in fact, the average user does not know of their presence. Such a thermostat might be placed in control of the switch for the vaporizer heating coil, so that whenever the temperature fell below the point at which the kerosene will properly vaporize the thermostat would automatically throw in the switch or control a solenoid for this purpose and thus provide the necessary heat. The temperature could be so set that the coil would begin its work before the temperature became too low, so that there would be no period during which the engine would be likely to load up.

If a vaporizer is not used, gasoline can always be used for starting, and the design of the manifold can be such as to supply the necessary heat after the engine is started. This again complicates the matter, as a separate tank must be supplied for the starting fuel, but this can be a small tank on the dash in view of the operator. Again, automatic control should be provided. It should not be necessary for the user to turn on the gasoline petcock, but this should be done by a thermostat without his paying any attention to it.

In the same way, just as soon as the engine gets up the proper temperature at which it will care for the lower grade fuel, the heat acting on the thermostat should automatically shut off the gasoline tank and turn on the kerosene. At this point, when both fuels are entering, there may be, of course, with the single adjustment of the carbureter some overloading or storing up of excess fuel, which for a few revolutions may cause smoke, but this is one of the details which in all probability will be taken care of by refinement in design, if any such method is eventually employed.

Combination Valve for Two Fuels

One maker has placed on the market a combination valve that will enable any user to turn on as much fuel from one tank as he desires, for combining in any desired proportion with that from another tank; for instance, a tank of kerosene and a tank of gasoline can be used, and these two fuels used separately or mixed in the desired proportion. The entire fuel supply can be shut off at will from the steering wheel to which the device is clamped.

The manifold is also important, this being the only portion of the engine proper that needs redesigning. Owing to the tendency of the low grade fuels to separate and leave a sticky, tarry residue, especially when heat is applied, any exhaust manifold used for heating the fuel should be so designed that it can be readily cleaned. Such manifolds are already on the market for use on the Ford car and are sold complete, together with a carbureter for handling both gasoline and kerosene, the combination displacing the exhaust manifold and the present carbureter.

The intake manifold must be short. This is to prevent condensation of the fuel from the mixture on its way to the engine. For the same reason it should be lagged. Even with the present grade of gasoline in common use this is an advantage.

Kerosene Carbureter Requirements

A special type of carbureter must be used. It may be necessary to heat the fuel in the carbureter or to heat air so it will vaporize the kerosene more readily and prevent

condensation. Direct heating, if carried too far has a tendency to preignite the fuel, especially if it is close to the flash point, and also to cause it to separate into its various grades, the most volatile passing over first, leaving an undesirable residue in the carbureter.

The introduction of slight quantities of water vapor with the fuel is well known and has been experimented on for many years. Its beneficial effects are recognized and some device for this purpose should form a part of every carbureting mechanism. It slightly reduces cylinder heat, delaying or prolonging the combustion, somewhat reduces the maximum cylinder pressure while keeping up the expansion curve or increasing the mean effect pressure. In other words, it flattens out the indicator diagram, which shows as a result a greater work area. Water vapor in proper proportion makes for fuel economy, longer life of the engine and less carbon.

From a study of the present fuel situation, it is evident that with the phenomenal increase in the automobile industry and its accompanying demand for gasoline, together with the increase in tractors, motor boats, farming machinery, stationary engines and other devices burning gasoline, and all this combined with an exportation many times that of any previous period, there is not sufficient gasoline for any extended term of years, unless something is done to change existing conditions.

Europe is begging for fuel and is willing to pay almost any price for it. Although there are independent makers, so-called, there is practically no competition between them and the Standard Oil Co. The smaller refiners accept thankfully the price no matter how high it may be. The difficulty of fuel transportation by pipe lines and the rates and control of these lines by the large companies, thus militating against smaller companies, are matters of government record and have largely prevented the growth of the smaller producers.

Remedies Suggested

The remedies seem to be a control of the distribution and the exportation of fuel, either by a tax on exports, as provided for in the Britton bill, now before Congress, or by some other method not yet devised; the improvement and general use of more economical distillation processes, a curtailment of waste and the development of crude oil fields, oil bearing shales and the natural gas districts.

The motoring public look to the automobile industry for protection. In protecting them the industry protects itself. There is surely capital enough as represented by various individuals in the industry to produce independent refineries and sufficient pipe lines within the next few years to create some real competition. The industry as a whole must recognize and meet conditions as they are, which means the use of kerosene as a fuel in the near future. The Society of Automobile Engineers, as a body, can have no more important work than an investigation of ways and means for making automobiles and trucks efficient on the less volatile fuels that apparently must form a large part of the future motor car supply. The suggestion is here made that this subject be investigated by a suitable committee or committees, that prizes be offered for the most efficient devices that engineering ingenuity can devise within a limited time for handling the kerosene or other possible substitutes for gasoline.

This information should be freely given to all car, truck and carbureter manufacturers to guide them in placing

on the market at the earliest possible date automobiles that can handle any hydrocarbon in an efficient manner. There is certainly no more important work that the society can undertake, and this work and investigation should rank with the great work of standardization.

Koenig & Luhrs to Build Motor Truck Chassis

The Koenig & Luhrs Wagon Co., Quincy, Ill., has begun the construction of motor truck chassis, the first one being completed on the fifteenth anniversary of the founding of the company. Before undertaking its new line the company installed the necessary machinery and employed a number of experienced mechanics to look after the new department.

The company will continue to build wagons, but if later the demand for wagons decreases materially, the company will be equipped to turn out auto trucks that will have the same quality which has placed their horse-drawn vehicles in the front ranks.

Stewart Body Plant to Be Doubled

The plant of the W. F. Stewart Co., body manufacturer, Flint, Mich., will be practically doubled, according to S. S. Stewart. The plant consists of half a dozen large factory buildings and some minor buildings. Additional floors will be put up on some, while in other instances additions to the buildings will be erected. A large number of dry kilns will be added, which will add at least 36,000 ft. of lumber per day to the plant's capacity. About 15,000 sq. ft. of floor space will be added to the sheet metal department.

Peoria Show Dates

The National Implement and Vehicle Show Co., of Peoria, Ill., has selected the dates for the 1916 exhibition. It will open September 26 and close October 7. President Sutliff has appointed the committees for the year. The committee on implement exhibits consists of C. A. Pattison, Peoria Drill & Seeder Co., chairman; J. B. Bartholomew, Avery Co., and J. W. Kinross, Emerson-Brantingham Implement Co.

Murray Mfg. Co. Gets Kemiweld Plant

The J. W. Murray Mfg. Co., Detroit, Mich., which makes sheet metal parts for automobiles, and which is now located on Clay avenue, has acquired the Kemiweld plant of the Detroit Can Co., and will locate there shortly. It will provide much larger manufacturing space, and the Murray company intends to add a large force of men.

Short of Men

R. V. Board, president of the Kentucky Wagon Mfg. Co., Louisville, Ky., reports that the company has been short of men and is putting many new workers in the various departments of the big plant which is now manufacturing wagons, implements, automobiles and trucks.

Now Sawing Its Own Logs

The Hayes Motor Truck Wheel Co., St. Johns, Mich., recently installed a new band saw and is now sawing its own logs. Heretofore the company had been using rough planks bought from lumber companies, which now is no longer necessary.

Kelly-Springfield Tire Co.'s Big Profits

Kelly-Springfield Tire Co., Akron, O., in its annual report shows gross profits of \$2,880,080. The total net income for the year, consisting of the net operating income, with other income, amounts to \$1,706,744, as compared with \$1,231,620 for 1914. Since 1914 the second preferred stock has been reduced by \$834,600 and the common stock increased by \$824,000. In 1915 the sinking fund received about \$91,000 additional and a reserve for bonus of \$70,674 was created.

Two Detroit Plants Locate in Cleveland

The H. J. Walker Co. has now removed its entire equipment from Detroit to Cleveland into a plant built for it on the grounds of the Chandler Motor Car Co. The Walker shops handle much of the Chandler company's machining.

A plant for the Briggs Mfg. Co., Detroit, is also being erected on a site adjoining the Chandler factory. In this plant the Briggs Co. will paint and upholster 20,000 bodies for this year's Chandler production.

Addition to E-B Wagon Works

In view of the increasing demand for Newton wagons and the inability on the part of the Emerson-Brantingham Co. promptly to take care of the orders, the company recently planned a substantial addition to the dry kiln equipment of the wagon works plant at Batavia, Ill. It is proposed to increase the dry kiln capacity 50 per cent, and this, in connection with a larger stock of materials in the yards, will enable the company to take care of the increasing business.

Winton Co. Reverses Color System on Its Cars

The Winton Co., Cleveland, O., has reversed the usual procedure, where both light and dark colors are used on closed car bodies and is now putting the light shades above the seat line and the dark shades below. This plan of coloring is believed to make the cars look more cheerful, since the human vision has a tendency to take in the upper half of everything before the lower portion is noted.

Belknap Wagon Co. to Enlarge

Belknap Wagon Co. will practically double its plant on Front avenue, Grand Rapids, Mich. The company makes automobile bodies especially for delivery purposes. It now has orders on the books for more than 250 special bodies.

Jeffery Raises Wages

The Thomas B. Jeffery Co., Kenosha, Wis., has increased the wages of 2,000 employees 10 per cent and reduced the working hours to 50 a week for day work and 55 for night work.

Thielens Becomes General Sales Manager

A. B. Thielens, assistant sales manager of the vehicle division of The Studebaker Corporation, has been appointed general sales manager of the vehicle division in recognition of nine years of faithful and efficient work.

Custom-Built Bodies Grow in Popularity

By Donald McLeod Lay, in *Automobile*

One of the most important tendencies brought out at the recent automobile shows is a strong movement toward body improvement and development, as evidenced by the increasing demand for custom designs. At these shows there were exhibited many more special bodies, or constructions in which the aim was to get away from the hidebound conventionality of the stock type, than were on display at any show of recent years. These attempts to strike a note of individuality, while preserving the best features of modern coach making, may be characterized as the forerunners of a more widespread adoption of the ideas which prompted their creation.

The art of the coach builder, far from being on the decline, as some of the devotees of the "good old days" would have us believe, is still a long way from the attainment of its highest development. But it is not the further refinement of the horse-drawn vehicle which will be responsible for its progress in the future. The coach builder's interest in this field of his work will shrink to comparatively small proportion beside the more attractive opportunities in the increasing demand for smart, distinctive and comfortable automobile bodies.

There is a large class in the United States that prides itself upon its fastidious tastes in every phase of existence. It aims to be distinctive, individual, and to have everything in life to correspond. Clothes must be smart, elegant and well tailored; homes must be artistic backgrounds for personalities; food must be dainty and delicately prepared and must represent the most exquisite dishes money can buy; and so on throughout the establishments, everything must be in keeping with these standards.

Want Something Different

In other words, people of this class are not usually satisfied to accept the stock bodies sold by the American automobile manufacturer. They want something different, and as the number of cars in use increases each year, so will this demand for specially designed and built bodies grow larger and larger as more car purchasers adopt the custom construction.

There are thousands of people throughout the country who, though not rolling in riches, are sufficiently prosperous to be able to afford the additional expense entailed by satisfying their sense of the fitness of things as regards the comfort and appearance of their cars. Today most of them take the stock bodies without comment because they have had no opportunity of seeing what the expert coach maker can do to express individual ideas and tastes. But when the wave of custom body design, which now seems to be gathering momentum in the east, begins to spread over the land, these people will be the first to take advantage of the new trend.

New York the Fashion Center

Of course New York City is the great center for the custom body trade in America today. Ever since the first days of the automobile industry, when the majority of the cars in New York were of foreign construction, European influence has been more strongly felt in that city than in any other section of the country. It was not many years before the wealthy families who were recognized as the leaders of fashion began to import chassis either separate or fitted with a specially-built body, designed to

order by one of the celebrated coach makers of Paris or London. This vogue, however, grew but slowly, because an imported chassis and body were not within the reach of many, even of the more prosperous classes, in those days. More recently, of course, foreign-built cars and bodies have become less a rarity than formerly, but it was apparently some time before anyone thought an American-built chassis was worthy of carrying a custom body.

Still, the fact that special automobile bodies were a distinction possessed only by members of the Four Hundred, set the fashion for the elite, the would-be-elite, social climbers, *nouveau riches*, etc. All set about procuring something distinctive, striking and frequently conspicuous, when the purchaser's taste was not as highly developed as it might be. Most of them, of course, bought European-made chassis on which to mount the new body, but some were not disposed to go to such expense and invested in an American machine, hoping that the body would disguise it sufficiently to prevent it being recognized as a domestic product.

Thus the custom-designed body increased in popularity year by year, the types built by New York coach makers to the orders of customers ranging from the most impractical and freakish offsprings of an untrained imagination to the most comfortable, luxurious and highly refined examples of the art ever turned out. More and more people saw these special creations running about the streets or along country roads and became imbued with the desire to own cars having the same distinctive qualities. The most enterprising dealers recognized this growing demand and proceeded to prepare special designs applicable to the chassis of the cars they handled, and thus was the American custom body industry inaugurated.

Today the number of firms designing and building bodies especially for the custom trade is growing almost from day to day. New concerns are springing up in all parts of New York City and neighboring districts, while the old established coach makers find that the equine phase of their business has dwindled to almost insignificant proportions, the bulk of their trade now being in special bodies for automobiles. And all these companies are having no difficulty in obtaining business; in fact, most of them have more work on hand than they will be able to complete for some time. It looks as though the coach builder has come into his own, so far as the eastern section of the country is concerned.

New York is the great fashion center for body design just as it was in the early days of the industry when the only basis for these fashions was furnished by the products of European designers. The growing vogue of the custom-built body is bound to spread to other cities; in some of them, Boston, Chicago, and Philadelphia, for example, its influence has already been felt, and during the coming season it should become more and more a factor with the car-buying public, not only of the large cities but also of the smaller communities. Even the small towns of but a few thousand inhabitants each have several families sufficiently opulent to be attracted successfully by the advantages and attention-compelling qualities of special bodies for their cars.

A National Field

This opens up a vast field which should be developed during the coming years. The new ideas and the refinements in material, construction and design, brought out

by the demand for the unusual, the beautiful and the durable in body work are bound to produce a marked effect on the stock body which the American automobile manufacturer will furnish with his car. It may be that more manufacturers will establish custom body departments as some of the high-priced car manufacturers have already done. It may be that stock bodies will be developed which may be changed readily in almost every respect to meet the requirements of the car buyer. The possibilities of the changes which may be thus indirectly brought about are so boundless that speculation is useless.

From present indications it would seem that the American custom body trade is graduating from a mere local occupation of negligible importance to a branch of the great automobile industry which will be national in scope, and involving thousands of men and immense capital. This will be the logical result of the formative conditions prevailing during recent years and at the present time. The demand is there, and where there is demand supply is usually forthcoming. The accelerated activity in the custom body field in New York City is significant of what may be expected, though probably in a lesser degree, first in the other large centers of population and later in the smaller communities.

Car dealers, particularly the more progressive, are featuring the attractions they are able to offer in the way of furnishing their customers with special bodies which will incorporate any of the car buyers' ideas regarding appearance, comfort and construction, although most of the dealers are far-sighted enough to point out the impractical side of any suggestion which would be likely to result in ultimate dissatisfaction to the purchaser. Many employ designers especially to carry out the ideas of prospects desiring special bodies while others maintain close relations with coach builders, permitting them to furnish everything from drawings to the complete body.

Illustrative of the value of suggestions made by car buyers to the body builders, and frequently these car buyers know practically nothing of automobile construction, one coach maker declares that he secures far more original and practical or near-practical ideas from his customers than from all of his competitors combined. And all report that customers are more numerous than ever before, because of increased prosperity and a wider recognition of custom bodies.

Automobile Kings

It seems incredible but it is a fact that no further back than a decade the three men who today occupy the most commanding places in the American motor car industry were poor or comparatively poor. Henry Ford had not begun to grow—financially speaking. A minus sign represented the bank resources of John N. Willys. William C. Durant, whose remarkable abilities have placed him at the very head of this industry, was making a dozen or so cars a year for which he had hard work finding a market.

Singularly enough, however, these business geniuses were endowed with a common vision. It was their good luck possibly but more probably their ability to read the commercial future that enabled them to divine, at about the same time though unknown to one another, that tide in the affairs of men which taken at the flood leads on to fortune. There was much laughter, in those days, at the

trials of the horseless vehicle, but these men had endless faith in its ultimate and overwhelming success. They saw in their mind's eye millions of horses displaced by the automobile and by the commercial car and the day when the horse would be as much of a curiosity on the streets of the big cities as the motor car itself was 12 or 15 years ago. Exactly what this faith and foresight was worth to them in dollars they only know but all the world knows that Ford's wealth is counted by the tens of millions, that John N. Willys in the past few years has become one of the country's multi-millionaires, and that William C. Durant is without a peer, almost, in his achievements in the great industry of which he is practically the head. Strange to say, furthermore, the remarkable trio attained their prodigious success while still young. Willys is on the sunny side of 40. Both Ford and Durant are hovering round the half century mark. Durant, to be exact, was born the year Sumter was fired on.—Boston News Bureau.

Motor Truck Club Hears Preparedness Speeches

The Motor Truck Club of America at its regular monthly meeting on February 16 at the Automobile Club, New York City, took steps to formulate plans for national defense. The speakers of the evening were: S. Stanwood Menken, president of the National Security League; Major Allan L. Reagan, instructor general; Capt. T. H. Shanton, Quartermaster Corps; Capt. Kenneth Gardner, Seventh Infantry, N. G. N. Y., and Geo. H. Pride, of the Heavy Hauling Co.

They discussed what has been done in Europe by reason of the preparedness which France and Germany had made long before the war was started, to have their motor vehicles listed and organized ready for quick mobilization. It was pointed out that this country has three times as many passenger cars than all Europe together and 10,000 more motor trucks than the combined forces of Europe. A committee to develop the resources of the club in trucks and men was appointed, comprising Mr. Pride, Roderick Stephens and Arthur J. Slade.

S. A. E. Summer Trip

The annual summer session of the Society of Automobile Engineers will again be held on the Great Lakes on the steamer Noronic. The meet will start on Monday, June 12, and end Friday evening, June 16. Accommodations for over 500 members will be provided and there will be the usual professional sessions, Standards committees' work, and, in addition, a trip through Lake Huron and Georgian Bay.

The office of the Recorder and the Standard committee has been moved from Detroit to New York, where it will be located in the general offices of the society, 29 West 39th street.

Want Standardized Truck Rating

Standardization of truck ratings is a subject that is constantly receiving more attention from manufacturers of machines and it is likely that the N. A. C. C. will be urged to take up the matter shortly. As ratings are now made there is a variation sometimes as great as a ton in the advertised load capacities of two trucks of almost similar specifications, while the horsepowers claimed will vary as much as 20 per cent. under the same conditions.

Predicts Increased Prices in July

Next July's automobile announcements will be not of new models, but of new prices and they'll be higher, according to George E. Smith, manager of the purchasing department of the Reo Motor Car Co., who is authority for the following:

"Metals of all kinds have at least doubled in value in the last six months, and in some instances the advances have been much greater, this applying particularly to tool steels. High speed steels have increased in price from 45 cents a pound and over, and this figure is a nominal one, high speed steel being almost unobtainable. This has affected the cost of tools made from such steels to an even greater extent than represented by the advance in the cost of steels, due to large increase in labor costs.

"High speed drills, which we formerly purchased at 65 per cent discount from list, are now priced at list plus 15 per cent up to one-half inch diameters; above this diameter they are list plus 30 per cent up to one inch, above which size the price is double the list.

"Cutters, reamers and small tools are now sold on the same basis, and are extremely difficult to secure. We are compelled to buy in small lots from different manufacturers and jobbers wherever we can find a small supply.

"Bar steels, used for making parts of cars, have more than doubled in price and prices are advancing rapidly, and the scarcity is increasing even more rapidly. Orders placed with the mills in December last are scheduled for delivery in January, 1917.

"Ordinary cold rolled bars cannot be secured from mills in less than six months. Steel tubing requires one year for delivery on mill specifications, and this item is also unobtainable from jobbers' stocks.

"Odd lots of bar steel and forging steel can still be secured from jobbers and mills in small quantities, and in order to maintain our supply we are compelled to purchase whatever can be found. For example: We have just completed a run of 1,000 six-cylinder crank shaft forgings, made from steel that was purchased while in transit to another customer, this purchase having been made by paying a stiff premium for the steel. For our next lot of 1,200 of these cranks we have just succeeded in placing an order for steel with a small mill in Cumberland, Md., which it promises to ship immediately, the cost being just double the mill price on contracts for this period, and nearly three times the cost of this steel in normal times. This condition applies to all kinds of steel products.

"Other metals are in the same shape, the price of copper at the present time being 27 cents, against 13 cents before the advance began. This also is practically unobtainable, except by purchasing at least six months in advance of our requirements. This affects all brass goods, such as castings, sheets, tubes, rods, etc.

Aluminum Hard to Get

"The aluminum situation is the same, the metal for immediate delivery being unobtainable, and the price at least three times above normal.

"Zinc, which is largely used in the manufacture of war material, is selling at 20 cents a pound, against 6 to 7 cents in normal times.

"Rubber advanced from 50 cents a pound to \$1 a pound, but has since receded to about 80 cents. The supply is absolutely uncertain and unreliable owing to lack of ocean transportation facilities.

"Leather remains extremely scarce and difficult to obtain in satisfactory quantity, the price being correspondingly high, costing at least one-third more than in the preceding season.

"With the possible exception of paints, there is not a single item in our factory that has not advanced from 10 to 300 per cent in cost.

"Another reason on which I base my assertion that next July's announcements will not be of new models but of new prices and that the prices will be higher is the railway car shortage that obtains at the present moment. No manufacturer is able to ship cars as fast as he can produce them, and that is going to result in the slowing down of a number of factories and the consequent extension of the date on which the present factory runs can be completed. In other words, many factories that have arranged to complete the present run by July 1 will probably have to extend the time over into next autumn. That also will affect the price.

"At first blush that last statement may seem illogical, but a moment's thought will show the force of it. For every day over that originally estimated as necessary to complete a certain number of cars the 'overhead' cost on those cars will increase. That increase, added to the excessive cost of materials that makers who are not already protected will have to pay, is bound to increase the cost of production very materially, and, inasmuch as the percentage of profit on automobiles is small anyway, there can be only one answer—to tilt the price.

"Just watch and see if I'm not right."

Must Indicate Seat Measurement

Taxicabs in New York City measuring less than 48 in. from the front seat to the rear and less than 41 in. in width must carry a white flag on the taximeter, indicating that only a single fare will be charged even if two persons occupy the machine. Those measuring 48 in. or more by 41 in. or more will carry a red flag, and will be permitted to charge a double fare when two persons are carried. The charge for the white flag taxicabs will be 30 cents for the first half mile and 10 cents additional for each quarter of a mile, and for the red flag ones the charge will be 40 cents for the first half mile and 10 cents additional for every sixth of a mile.

National Forest Fires in 1915

Forest fires burned over not quite 300,000 acres of national forest land in 1915, or less than two acres per thousand. Out of a total of 6,324 fires, 346, or 5½ per cent, did damage to the amount of \$100 or more.

The timber loss was 156,000,000 board feet, valued at \$190,000. Although the season was regarded as one of unusual exposure, owing to delayed fall rains, the loss was materially below the average of the last five years. Over 87 per cent of this loss occurred in the states of Oregon, Washington, and Idaho, while more than 72 per cent was in Oregon alone. Lightning figures as the chief cause of forest fires in 1915, as it does in the average year.

2,430 Fords in One Day

The Ford Motor Co., Detroit, broke its previous output and shipping record February 29, when 2,430 Fords were made and shipped. This is 330 more than the previous high-mark.

Instalment Plans Increase in Number

There is a movement of considerable proportions among automobile manufacturers to devise a credit system that will permit the sale of cars on deferred payments and at the same time relieve the dealer of the burden of carrying the notes. Several companies have announced arrangements that accomplish this double end, while some others, it is understood, are completing plans with a like purpose in view. In general the method adopted is to finance these credits through an independent company which agrees to advance cash on the dealers' notes. Each particular system, of course, differs in the details.

One of the companies that have recently made announcements of this kind is the Chalmers, of Detroit. The Agricultural Credit Co., of Chicago, it is stated, will handle all paper arising from the time sale of Chalmers cars throughout the United States. After an initial payment, which is considerably less than half the list price of the car, the remainder is divided into eight monthly instalments.

Another company that has taken a similar step is the Studebaker. The Commercial Investment Trust, of New York and St. Louis, will supply the banking facilities for the deferred payment selling of the Studebaker cars. Under this plan these cars will be sold for one-third down and the rest in eight equal monthly payments.

The Willys-Overland Co. some time ago announced the completion of plans to finance sales of its cars on part payments. The Guaranty Securities Co., of Toledo, handles this business for the Willys-Overland. The initial cash payment required is less than one-half the value of the car. The rest of the payments may be extended over eight months.

The Bankers' Commercial Corporation, of New York, capitalized at \$1,000,000, and recently organized under the banking act of the state, will supply a similar accommodation to the Paige-Detroit Motor Car Co. Under this plan the purchaser of a car makes a cash payment of one-half the list price plus a small additional amount for fire and theft insurance premiums for one year; the remainder of the amount due is divided into eight nearly equal monthly payments.

The Maxwell Company was the first to make a public announcement of a systematized arrangement for the sale of cars on the instalment plan. Its credit business is transacted directly through the company instead of through a subsidiary or independent banking company. The Maxwell plan requires 50 per cent of the price of the car in cash. The remainder is divided into eight equal monthly payments.

Novel Selling Method for Used Trucks and Cars

Selling used trucks and pleasure cars in a capacious room with a demonstrating road an eighth of a mile around, is the unique method employed by an enterprising Los Angeles dealer. For that purpose a lot opposite the Washington ball park was leased, the grounds usually occupied by the circus, and on it was pitched a real circus tent 400 ft. long and 200 ft. wide. Under the "big top," as the showman terms it, there is display space for 500 machines and 5,000 prospects can view the trucks, pleasure vehicles and delivery cars on sale.

Without leaving the tent, the salesman can take the

prospect on a test ride, for a track that has eight laps to the mile is fairly well adapted to showing off a car. Besides the elliptical course, there is an artificial hill, with a grade of 20 per cent, on which the machine is run to show what it can do on an incline.

A dozen salesmen are kept busy here all the time, for private sales are in order constantly, and in addition to that there is a big auction every Tuesday and Saturday. This draws the crowds, of course, and the selling is brisk. It is customary to show off the machine on the track before putting it under the hammer, then it is tried out on the incline and finally it is exposed on a platform, where everyone in the tent can see it plainly. Then the auctioneer uses his eloquence to good effect.

One of the commonest transactions in western motor dealing, says Commercial Car, is the exchange of used cars or trucks for real estate or diamonds. In fact, many auto dealers in the west are experienced realty men and diamond experts, so to meet this demand an exchange bureau for gems and lots has been established in the big tent. To indicate the demand for this service it may be stated that a short time after the business had been established, there were listings of 800 lots on file in the canvas salesroom, and 15 diamonds reposed in its safe. And trucks, light commercial cars and pleasure vehicles from runabout to limousines were lined up on the sawdust by the score and hundred.

A fee of \$1 a week is charged to enter the car in the tent, which includes entry in the twice-weekly auction if desired. The commission is 5 per cent on straight sales and 2 per cent for sales by competitive bidding. In the first two weeks that the business was operating, 20 machines were auctioned off, 31 were sold privately and 148 cars had been received for private sale.

Some large auto agencies have seen the advantage of this proposition, and in order to keep their used car department separate from the regular business, they have adopted the practice of handling their traded-in machines in the tent.

Dealers welcome the method, as it affords a quick outlet for used cars, and the public is encouraged to sell the old machine for cash and in turn secure the advantage of cash discounts in buying new motors. As one agent expressed it: "The cash buyer is the one who makes the dealer happy, and he is the one who is most likely to be happy himself, because he knows that he has made the best buy possible."

Varnish Imports Into Certain Countries

The Bureau of Foreign and Domestic Commerce has compiled statistics showing the quantities and values of the imports of varnish into Peru, Mexico, Argentina, Uruguay, Bolivia, Costa Rica, Venezuela, Brazil, and Spain, according to the official statistics of these countries. A copy of the table may be obtained at the Bureau or one of its district offices.

Making Bodies as Well as Motor Cars

The Anderson Motor Co., successor to the Rock Hill (S. C.) Buggy Co., announces that in addition to making motor cars it has also accepted orders for bodies, and in the future will manufacture them for other makers, in connection with the bodies the company is making for its own cars.

Paint Shop

"Painting by Immersion and Compressed Air"

The following article is reproduced from an English hand book entitled "Painting by Immersion and Compressed Air," the work of Arthur Seymour Jennings, F.I. B.D., editor of *Decorator*. The methods described have been in use in a number of American motor manufacturing plants for some time now, an excellent description of the process employed at the H. H. Franklin Mfg. Co. plant appearing in the November (1915) issue of *The Hub*:

The "Flowing-on" System

The very latest method of finishing automobiles which have steel bodies is that at present in use at Manchester and elsewhere. The method is a remarkable one, not only because of the great saving of time it effects, but by reason of the fact that the "life" of the painted or enameled surface is prolonged by the improved method.

Stated briefly, the process consists in coating the body with blue-black enamel by means of gravity only; that is to say, the enamel is placed in an elevated tank and discharged on to the work through a flexible pipe and slotted muzzle opened by a lever which is actuated by the thumb of the operator. Thus no spraying is required, while dipping is out of the question, as only the outside of the body is required to be painted.

Each coat takes two minutes to apply to the whole surface of a four-seated motor body! An achievement which justifies our use of the word "remarkable."

But it will be convenient to explain how the present method came into use. Until a few months ago the several undercoats were sprayed on the work in the ordinary manner, but the finishing coat of varnish was flowed on by the gravity apparatus now referred to. Then it was thought that the undercoats might be applied by the same method, and some careful experiments having been made, it was found that by dispensing with the spraying and flowing on the coats a much more satisfactory result was obtained. As the new method caused more paint to adhere to the work than would be put on by the spray under ordinary conditions, one coat, it was found, could be dispensed with altogether. There was also less rubbing down required because of the very smooth coat obtained by flowing on, and, above all, the time of applying the coat was reduced to the extraordinary short time of two minutes.

The apparatus employed for this work is of the simplest character. The car body is placed upon a platform mounted upon wheels. This is made of exactly the right size to fit between a V-shaped metal trough which surrounds three sides of the body and is intended to receive the superfluous paint, a considerable quantity of which drips into it from the body as the enamel is applied. This trough is slightly inclined so that the paint which drips off all runs to one point, where it passes through a gauze-covered orifice, descends to a small tank beneath, whence it is pumped up to the elevated tank above, and is then ready to be used again.

This elevated tank is cylindrical, and holds, perhaps, 25 or 30 gallons. It is stationed overhead some 12 or 15 feet high. From this tank descends a flexible metal pipe or hose ending in a slotted nozzle, opened by a lever, which is operated by the thumb of the workman and is closed by a spring. This completes this simple though very effective apparatus.

The body of the car is made of stamped steel which has already received a protective coat of paint of a dull red color, the body being placed upon the platform or bogie, in position with the V-shaped trough surrounding it on three sides. The first or undercoat is given by rapidly passing the clotted end of the lever valve over the surface, upon which the paint literally pours out. The top part receives attention first, and the paint runs down over the surface, which it covers completely, excepting perhaps here and there, where the discharge of paint is directed, and the whole of the outer surface of the car is, as already stated, completely covered in two minutes. This coat dries semi-flat.

In order that the discharge pipe may be kept nearly vertical and be moved around the car as the different sides are dealt with it is provided, at its upper end close to the point where it joins the tank, with a brass swivel union and a horizontal arm which swings around. A stop-cock is also provided.

The undercoat having been applied, the body is allowed to rest for a few minutes until the dripping ceases. It is then wheeled on the bogie across the room to an oven, in which it remains for one hour at a temperature of 160 deg. F. This heat is found to be sufficient to bake the paint, but is not high enough to injure the woodwork which, of course, forms part of the body. At the expiration of the hour a little stopping of inequalities of the surface is usually found necessary, but in any case the surface is lightly rubbed down with fine glass-paper.

The body is now brought underneath a second tank, with the V-shaped surrounding trough exactly as before described, and here it receives another coat of enamel or paint, which in this case has a little more body and gloss. After stoving as before and at the same temperature, the surface is carefully but rapidly rubbed down with powdered pumice stone and water applied by means of felt pads.

There are a series of four troughs and tanks in all, corresponding in number with the coats to be applied. From the third one the body receives a third coat, is then baked or stoved, rubbed down with powdered pumice and water, thoroughly cleaned off, and from the fourth tank receives the final coat of varnish, which completes the operation. This coat of varnish is not stoved, but is air-dried. The finish is a blue-black picked out with very dark blue, and it is free from any signs of runs or drips; in fact, no one could tell how the application was made. As already remarked, the coats of paint are somewhat fuller than would be the case if they were applied by spraying, and the durability is thereby increased.

The output from this department is 70 cars a day, a

number which would be practically impossible if the work were not so splendidly systematized.

It should be observed that the varnish is applied in a separate room from that used for the application of color. This is done in order to exclude dust, and also to maintain the temperature at 90 deg. F.

In considering the essential points of this method of finishing motor bodies, it is clear that the system might be successfully applied in very many other industries to a great variety of goods. The apparatus is so simple in character that no engineer would have the least difficulty in designing a plant suitable for any particular requirement.

It must be added that the crux of the whole situation is the kind of paint or enamel used. It must be sufficiently viscid to hold on to the surface to which it is applied, sufficiently liquid to run off freely without leaving runs, tears, or "fat edges." And, above all, it must flow out uniformly. All these conditions, however, apply also to a dipping plant, and only require careful consideration on the part of the paint manufacturer who has made a special study of the subject. The varnish applied by this method must also be of a special character, so that it may flow out nicely without yielding too thick a coat, which would be likely to lead to blemishes. Ordinary paint, enamel or varnish, then, will not answer for this class of work, but special products must be employed, and when these are obtained the rest is comparatively easy.

The Floco Process

This process is in some respects similar to that above mentioned, the difference being that it is intended principally for the application of varnish by flowing over a painted surface done by spray. The essential difference in the apparatus is that the varnish, instead of being discharged by gravity, is pumped up from a tank. It is largely used in America, and is manufactured by the De Vilbiss Mfg. Co., Toledo, U. S. A. It is particularly suitable for automobile bodies and large surfaces generally.

The process flows such materials as varnishes, enamels, and japans, when it is impracticable to spray them. It has superseded the inadequate, inefficient flowing systems used in the past, and is also replacing brush and dip methods as practiced in many instances.

The equipment of the process comprises a 15-gallon tank, drawn from one sheet of steel and heavily tinned; 1/6 h.p. motor, housed in, driving a rotary pump; regulator; nozzle; electric fittings; flexible fluid hose, and galvanized iron drain trough on rack. All parts, excepting nozzle, hose and trough, are mounted on a castored truck for moving about. The truck is equipped with a rack around which to wind the hose when not in use, and a holder for the nozzle.

The finishing material, such as varnish, to be used is pumped from the bottom of the tank by an electric motor-driven pump, in a continuous stream, through the flexible hose, to the nozzle. The flow of material is adjusted by the regulator, by means of which a varying amount is not put into use and returned to the tank. In this way the flow from the nozzle is instantly adaptable to any class of work and viscosity of fluid without changing the speed of the motor.

When the nozzle is closed the material pumped is all forced back into the tank through the overflow. This serves to agitate the material; in fact, is the only agitation

necessary with material containing pigment, such as color varnish.

The body to be flowed is placed over the drain trough. The operator first applies the material all along the top, then flows it copiously over the upper half of the surface. Sufficient material is thus applied to insure a perfect flow to the bottom. The job is allowed to drain into the trough which carries the material back to the tank—here it is strained, and, without the slightest waste, used again.

Only enough material is put into the tank to take care of the work at hand, or to handle the day's production. The maximum amount of material exposed is 15 gallons—the tank's capacity. The nozzle will operate satisfactorily on a gallon of material.

The tank, motor, pump, and regulator are, as previously stated, mounted on a truck fitted with castors, permitting of these parts being moved about with the greatest of ease. Another appreciable advantage of this style of arrangement is that an extra truck can be kept on hand and put into immediate use in case of accident.

Automobile Repainting

Repainting the motor car presents difficulties which are for the most part quite unknown in connection with the same work applied to horse-drawn vehicles. Especially is the body surface subjected to so much excessive jolting, wrenching and ugly contortions, that when it comes to the painter for a fresh application of paint and varnish there is much to do which, while seemingly unimportant, is, nevertheless, absolutely essential.

Perhaps the surface shows a noble display of fissures for the effectual elimination of which the owner is not prepared to pay, declining even the cost of applying rough-stuff to the surface. To meet this condition and satisfy the customer, proceed as follows, bearing in mind the while, that the remedy is merely a substitute for necessary thoroughgoing process:

Sandpaper the surface lightly to knock off the knobs and knuckles of dirt, if any. Then dust off thoroughly and flow on a generous coat of gold size japan. Permit this coat to dry 36 hours, and then run over it lightly with No. 0 sandpaper to kill the gloss and reduce any existing dry motes. Then lay on the coat of color and proceed to a finish in the usual way. The gold size reaches into the minute orifices, filling and sealing them against suction and absorption of the following coats, at the same time affording a quick and comparatively inexpensive method of conditioning the surface to finish upon.

It may happen, too, that a split panel in the body shows, and in the absence of the wood-worker, bore a 1/4 in. hole at each end of the fracture, putting one hole just at the end, and connecting with the crack, and the other one quite clear of it. Next plug the holes up and dress off perfectly even and true with the surface. Follow this by cutting a shallow bevel on both sides of the crevice and parallel with it, by this method giving the putty, when applied, opportunity to resist the cracking tendency of the fissure. Now give the dressed off part of the wood a good coat of oil lead. Give this lead three days to dry right, after which putty the cavity with a pigment made up of 1/4 keg lead, 1/4 best bolted whiting, and 1/2 dry white lead, kneaded to proper consistency in equal parts of rubbing varnish and coach japan. After 36 hours rub the hard mass to a perfect level with the surrounding surface with a piece of rubbing stone dipped in raw linseed oil.

Then carry forward the customary painting and finishing processes.

It not infrequently happens that the painter gets a smear of paint, or grease, or stain, on the cloth lining of the car, or at least finds one or more there, in which case dampen the goods with refined gasoline, and rub briskly with a clean woolen cloth. If the spots are detected while the smear is still wet, procure, if possible, pieces of the same kind of cloth of which the lining is composed and rub smartly cloth to cloth. This is an effective treatment and possesses the merit of being simple.

The big limousines after painting and finishing furnish plenty of window glass to be cleaned, to accomplish which saturate a soft sponge with two parts denatured alcohol and one part water, and apply to the glass, using a putty knife, ground sharp on one side of the blade to loosen and cut away any hard pigment located along the edge of the glass. If there are any especially hard daubs of pigment, which do not yield readily to the knife or alcohol, wet them up with oxalic acid. Use a clean, white cloth, free from lint, to polish the glass with, and follow by rubbing with a roll of soft paper, upon which has been dusted a pinch of dry refined lampblack.

Upon these same limousines, and other classes of cars, for that matter, which are furnished with doors, it is excellent practice to finish the jambs and pillars and other parts that are likely to stick through surface contact, in a polished rather than in an ordinary varnished state.

Bring the parts up with a strong, rich foundation of rubbing varnish, which, when at last thoroughly dry, rub with water and No. 00 pulverized pumice stone. Then procure some good varnish polish and proceed to bring the dull rubbed surface to a fine, rich lustre, which neither sticks through contact with another surface or mars readily. In point of fact, this is an ideal finish for the parts in question.

Paint Shop Pointers

Burned and smoked spots on a body, when in lead color or roughstuff, should be carefully scraped and cleaned before any attempt is made to coat over the job, or trouble may be expected at these points in the finish.

To make a putty that will sandpaper easily and yet remain where it is placed, take dry white lead and mix it in ordinary brown japan, and add a little lampblack and a few drops of rubbing varnish. If the putty is desired to sandpaper very easily, a little turpentine may be added with advantage. The more varnish added, the tougher the putty will become, and the more difficult it will be to sandpaper it.

To prevent pumice powder from being rubbed into the varnish, simply let your varnish coat become sufficiently hard before you attempt to rub it, and do not allow your pumice powder to dry on the varnish, but wash it off clean before it has any opportunity to stick.

The best plan for cleaning a varnish room floor is to sprinkle it thoroughly with well-wet sawdust, and then sweep clean. This will avoid the necessity of wetting the floor, which is highly objectionable. In high latitude snow may be used in the place of sawdust.

A little glycerine added to the water in which paint brushes are suspended will prevent freezing in winter, and will not harm the brushes.

Black japan is usually applied with a panel brush, and laid off the same as rubbing varnish.

Endeavor to give the principal letter prominence, either in size or color, and have the monogram legible, and so arranged that the letters will naturally be read in the order intended.

Many brushes are ruined by being carelessly left standing in a tub of water. They should be suspended so that the bristles cannot touch the bottom.

A Few Words on Brushes

As "cleanliness is next to godliness," so is a clean brush next to a perfect finish. It is just as important, or more so, to have a clean brush with which to finish a perfect job, as it is to have a clean varnish. Specky or dirty varnish can be removed from a job in a few minutes, but a specky or dirty brush takes days to work out clean. Brushes are like apprentice boys. They need to be educated or broken in before they are able to do a finishing job. A new brush is full of dust and loose hair, and is no good for varnish until broken in. It should be first well shaken, or twirled out, then allowed to hang in a mixture of raw oil and turpentine for a few days, then scraped out dry and used in a varnish that is to be put on some unimportant part of the job like the inside of a carriage body, the upper deck of a car, or the trucks. After a week or so at this work, clean out thoroughly and put it in a rubbing varnish. In a month or so, according to the amount of work it has done, it should be cleaned out again and used for finishing, but not on a first class job until found clean and satisfactory.

When a brush is in perfect condition, it should only be used for a fine finishing job and by the same man every time, if possible, as no two men handle a brush the same way. When through with the job fill the brush with the finishing varnish used and place it in a brush-keeper in which there is a brush-keeping varnish, suspending it deep enough to cover half of the binder. This keeper should contain no other brushes except finishing brushes. Rubbing brushes hold more or less of the dirt or pumice from the job and are apt to cause the varnish in a keeper to become dirty or specky and are not safe for keeping finishing brushes in, so they should be kept separate.—The Finishing Touch.

Specks in the Varnish

If the varnish has been allowed to skin over by exposure to the air, then look for trouble. Some varnishes will, of course, skin over when kept constantly corked; the skin breaks and mixes with the varnish and so gets on to the job. Then there are other causes of specks, such as dust or pumice stone powder left on the job; dust in the air; cracky shops that admit the dust; lice or dirt in the varnish brush; and the cure is prevention.

Keep the varnish brushes clean by this method: Have solder run into the rivets in the tin or ferrule of your brush and smooth it off. Turpentine or oil in the brush may cause specks in the varnishing, and so also if turpentine has been used to thin the varnish with.

The best way to keep varnish brushes is to suspend them in the varnish that they are used in generally. There is one disadvantage to this plan, however, namely, that the varnish is apt to harden; to overcome this as much as possible, it is well to have a tightly fitting cover to the can in which the brush is kept.

A flat bristle varnish brush is good for the flowing coat

at least, as the stiff bristles cut through the varnish and bring up and intermix the under portions, spreading it out more evenly than a soft brush would do it. Where the varnish is a very elastic one, good results may be secured with a soft brush, and especially where the coat is thin and light. But such a job cannot have the full and rounded out appearance that heavy bodied coats give.

Method of Determining Oil and Resin in Varnish

Results of experiments to find the best method of determination of oil and resin in varnish have been published by the United States Bureau of Standards in Technologic Paper No. 65. Several methods are discussed, but the conclusion reached by the Bureau is:

The proposed method for the determination of oil and resin, involving esterification by the Twitchel or Wolff methods, the use of ether as solvent after esterification and correction of the figures by appropriate factors, gave results which were sufficiently accurate for practical purposes, and appear to be the best method so far devised for general use.

In explaining the situation that led to these experiments, the technologic paper states that in spite of the fact that several methods have been published for the determination of oil and resin in varnish, there has been a noticeable lack of information regarding the accuracy of the results obtained, due largely to the failure to test the procedures with varnishes of known composition and history. It was considered desirable, therefore, to obtain such information, and to devise, if possible, a method which would be satisfactory. It is shown by the Bureau that several methods to be found in the literature are not reliable for all types of oil varnish.

Artistic Effects in Lining

Vermilion glazed with carmine makes the richest red lines.

On a green ground, nothing approaches the appearance given by carmine lines.

For blue lining, add flake white to Prussian blue, or to ultramarine blue.

Handsome blue lines may be obtained by lighting Prussian blue with a little white, then splitting the center of the blue line with an $\frac{1}{8}$ in. black line, then glazing over with an ultramarine line a trifle wider than the line.

Some of the most striking colors for lining with are Naples yellow, cream, white, orange, blue, and its shades. medium and dark green, drab, salmon, burnt umber, tinted with yellow, burnt sienna slightly tinted with white, and orange and buff glazed with carmine.

American and Foreign Roads

A New York engineer, H. W. Durham is his name, discusses pavements and in his digest of the subject he emphasizes that for satisfying and enduring wear the cobblestone is altogether best. And in passing on the pavements in American cities, Mr. Durham puts the stamp of inferiority on them as compared with the roadways of European cities. He says that "the classification in accordance with quality (of pavements) can be made as (1) modern improved granite pavements, (2) a small amount of satisfactory fasalt, which is a tough rock forming a concrete filler, and sand and limestone. (3) a great majority of in-

ferior stone pavements." In European countries deep study is given beforehand to the building of a roadway. Their methods are standardized, here methods are slipshod. Says the speaker: "The American mind possesses almost childlike belief in the efficacy of words and the average public spirited citizen or responsible official charged with road construction has come to believe that the best specifications must of necessity be complicated," which is but another way of saying that the fellow with an oily tongue who may be armed with a set of specifications, can, and often does, win out over another whose proposition may be entirely superior.

This to Europe: "In Paris and Berlin more than 50 per cent. of the street area is paved with stone block, in Vienna nearly 50 per cent., and in the large German cities ranging from 500,000 to 1,000,000 in population the percentage ranges from 40 to 80 per cent. In the 76 leading cities of Germany, containing one-fourth of the total population, considerably more than 50 per cent. of the entire paved area is of stone, while similar cities in Belgium are almost exclusively paved with stone. The percentage in the large French cities varies from 25 to 100, while London, whose paved area exceeds the total paved area in the next three continental cities—Paris, Berlin and Vienna—has about 20 per cent. of stone paved streets. In British cities of the second class the percentage varies from about 15 in Birmingham to over 60 in Liverpool. In none of them, according to Mr. Durham, with the exception of small areas of extremely expensive dressed blocks, are their better stone streets superior to our best. Their average, however, is undoubtedly ahead of ours, and there is no such extent of rough-riding, turtle-backed, wide-jointed stone streets."

Anent the foregoing, the wonder is how our roadways compared with those abroad before we started in building the cement pavements that now line the highways of every state and county in the land and for which improvement the automobile clubs and allied interests must be given credit.

Does the subject of good roads interest us? Undoubtedly it does, for we appreciate the fact that their building has done much toward adding to the business of every smith and shoer in the country, not to speak of the benefits derived by manufacturers of our products. Indeed, we may credit improved highways with keeping up the splendid front that horseshoeing wears, and possibly but for such improvement the advertisement writers for automobile manufacturers would have much more reason to speak as they do about the decrease of horses.

Court Holds Maker Liable for Defects

A manufacturer is liable for defects in an article which causes injuries to the purchaser, even though the article is purchased through intermediaries, according to a decision of the Court of Appeals, at Albany, N. Y., March 14. The decision is said to establish a new principle in law, for previous court rulings held that manufacturers were liable only for articles inherently dangerous, such as poisons, explosives and firearms.

Suit was brought to recover damages resulting from being thrown out of an automobile purchased a year before the accident. One of the wheels collapsed and it was found that it had been constructed of defective wood and that the defect could have been discovered upon examination before the car left the factory.

The Physician in Industry

By Magnue W. Alexander

In the early history of medical work in industry, the regular employment of a physician in an industrial establishment was usually considered an evidence of a largely benevolent attitude on the part of the employer. Whether or not this assumption was true, the results showed that the work of the physician in industry proved beneficial to the employer as well as to the employee, by protecting both against undue expense arising out of injury and sickness and by promoting a better mutual relationship. The results also proved that medical supervision of employees increased their efficiency, and that prompt medical and surgical treatment of injured and sick employees prolonged their lives and the period of their industrial usefulness.

The great value of the physician in industry became even more generally realized when workmen's compensation laws went into effect, which compelled the employer to shoulder the expense of injuries to employees regardless of the fault of either party. These laws forced the employer, in self-defense, not only to provide adequate medical and surgical treatment for employees injured in his establishment, but also to exert all **reasonable effort** for the prevention of future accidental injuries and for the elimination of working conditions that might prove harmful to the health of his employees. Experience, however, had shown that physique, temperament and general physical condition of employees affected to a large extent their liability to sickness or injury. Some men could safely do work that constantly required considerable physical effort, while the same work would cause discomfort and strain to other apparently strong men. Employees with defective vision would suffer headache while doing work that required close application of their eyesight, while others with normal vision would naturally have no such trouble when similarly engaged. Contact with certain odors or liquids used in manufacturing processes would cause skin irritation or other disturbances to one person, while hundreds of others working under exactly the same conditions would be entirely unaffected.

Aside from looking after the health of individual employees the physician in industry also renders a valuable service by bringing to light those general conditions of employment that may adversely affect the health and comfort of all workmen in common. By his co-operation with the employer and foremen in securing wholesome ventilation and proper lighting conditions, and by inducing employees, by personal advice or through suitable literature, to adopt healthful habits in the shop and home, the physician brings into play simple, far-reaching measures that tend to raise the health and therefore the efficiency standard of the entire working force.

The Training of First-aid Men

The physician also finds specific functions to perform, such as the training of an adequate number of persons in each employment, so that they can themselves as laymen effectively treat slight wounds that do not demand a physician's service, or give temporary assistance in cases of serious injuries that need emergency attention pending a physician's arrival. The presence of such a body of trained first aid men is so much the more important when the industrial establishment is located at a considerable distance from the physician's office or dispensary, or when

injuries occur when a physician is not immediately available.

In a large plant the physician becomes part of the organization and devotes his entire time and effort to the welfare of its employees, while in smaller plants or in those where the work is practically free from hazard, he spends only a part of the day in the medical care of employees, or he combines a number of such plants under his medical supervision. Apart from the medical aspect, however, enlightened employers are beginning to see quite clearly the value of a physician as a staff member. They have learned to appreciate that his peculiar relationship to employees as a friendly medical advisor enables him to exert a wholesome influence upon their mental attitude as well as upon their physical welfare. It should therefore not be surprising to find in future physicians regularly attached to the organization of even small plants, where the medical supervision of employees alone would not be a task large enough to warrant the full time employment of a medical expert, but where his spare time may be used effectively in assisting the management in the general supervision of employees.

Special Tasks and Problems

The physician in industrial practice encounters a great many tasks and problems that do not arise ordinarily in private practice. He often finds himself dealing with a great number of people whose needs must be met promptly, effectively and with a minimum expenditure of time. Many of these are unfamiliar with the English language and are unable to make their needs and wishes understood or to understand the inquiries and directions of the physician who speaks English only; others are mentally backward and difficult to deal with on that account. Some are unclean and careless in their personal habits, thereby causing their wounds or ailments to improve only very slowly even under the best of care, while others have a generally antagonistic attitude. Some are even dishonest and try to conceal or falsify the real cause of an injury; they would rather feign inability to work and secure part pay while loafing, than perform honest work and gain full wages. Moreover, there are those who themselves believe, or by some doctors are led to believe, that they are seriously injured and incapacitated for work when they are not. Yet the physician in industry must patiently and persistently cope with all these conditions in his endeavor to cure these people of their physical ailments and to disabuse them of their mental illusions.

The question of where the physician in industry should terminate his care of injured or sick employees and at what point an employee's private physician should assume such responsibility, is another problem that must be solved in a satisfactory way. What duties to delegate or not to delegate to the nurse employed in the establishment under his supervision; what instructions to give and what materials to furnish to laymen authorized to render first aid or emergency treatment to injured employees throughout the plant; how best to render some industrial operations free from the hazard of occupational disease, or how to protect workmen against such hazards if they cannot be eliminated, are questions that he is called on to answer in an intelligent and practical manner.

In the solution of these and similar problems the physician in industry often finds himself in a quandary. Previous training and experience had made no specific provision for their solution; in fact, many of these prob-

lems have but recently become recognized. In most cases the physician in industry has been obliged to find an answer to each problem practically alone and as best he could. Sometimes he has hit on a method that was only partially satisfactory; sometimes he has achieved results that were all that could be desired, while at other times he has failed in his aim. Occasionally, through a comparison of conditions and an interchange of experiences, physicians connected with industrial enterprises would reach common conclusions that would point to simple and practical remedies. The value of such informal conferences naturally led to a desire for a more systematic interchange of ideas extended over a larger group of physicians dealing with medical problems in industry.

The Conference Board of Physicians

A preliminary meeting of physicians engaged in industrial practice held in New York City on April 4, 1914, indicated that their varied knowledge and experience could be so combined and harmonized as to afford composite and definite conclusions that would be valuable to themselves and to the industries they represent. It was also felt that the findings could advantageously be made available to all physicians in industry to the end that employers and employees generally might reap benefit therefrom. The concrete outcome of this meeting was the organization of a "Conference Board of Physicians in Industrial Practice," the scope and work of which is embodied in the official declaration that

"The Conference Board of Physicians in Industrial Practice is organized for co-operative effort in introducing into industrial establishments the most effective measures for the treatment of injuries or ailments of employees; for promoting sanitary conditions in workshops; and for prevention of industrial diseases."

In launching this movement, the Conference Board on Safety and Sanitation (composed of national associations of employers, such as the National Founders' Association, the National Association of Manufacturers, the National Metal Trades Association, and the National Electric Light Association) has been a helpful factor, and the two conference boards have since been working in close, harmonious relationship; that of business executives looking for professional advice in safeguarding the health of employees, and that of physicians offering medical judgment as the result of combined study and experience.

The physicians constituting the board are all men of wide experience in their respective fields, who have gained a thorough understanding of the requirements of industry from the humane viewpoint and of the physical ability of men and women generally to meet these requirements.

Dr. John J. Moorhead, of New York City, the chief medical officer of the Interborough Rapid Transit Co. and the New York Railways Co., is chairman of the conference board, and M. W. Alexander, of the General Electric Co., West Lynn, Mass., is the executive secretary.

The companies represented by these physicians employ over 250,000 men and women, skilled and unskilled, of many languages and nationalities, and working both indoors and out in generally diversified occupations.

The board meets periodically. So far eight meetings have been held and some important results have already been achieved; much other work of far-reaching character is now under consideration. The individual members of the board are actively co-operating in the prosecution

of research work in respect to special problems which can be studied best in the particular industry with which they are connected. The results of individual investigations, however, are referred to the board for broad consideration and joint action.

Instructions to Laymen for First Aid

One of the first tasks assumed by the board was the development of "Instructions to Laymen for First Aid Treatment of Common Injuries and Disorders." It was the intention to issue instructions of such simple character that they could readily be followed by the ordinary man without even an elementary foundation of first aid knowledge. The instructions agreed upon by the board are concise and pertinent; they stipulate what the laymen should do, without wasting any words in stating the reasons for so doing.

The board also co-operated in a very practical way with the conference board on safety and sanitation in the development of the "N. A. S. O. Standard First Aid Jar," a compact, sanitary and convenient first aid outfit consisting of a dust-proof glass jar in which first aid materials are contained in well ordered arrangement. The first aid instructions are printed on the inside of the glass jar cover and are therefore always at hand when needed. These first aid jars have been made readily available to employers and are now being used extensively in industrial establishments, in public institutions and private homes.

Physical Examination in Industry

The board agreed upon the various defects requiring attention in physical examinations, and the various degrees of such defects, on the basis of which the suitability of an individual for a specific employment can be determined. The board also standardized a "Physical Examination Record Card" of convenient size and so arranged that a sufficiently clear and comprehensive record can be made with a minimum amount of clerical work. These record cards have already been used in thousands of cases with entire satisfaction.

The board decided to prepare a set of "Health Hints" of prophylactic character, written in simple, concise and direct language, so that they can be readily understood by the average person. The care of the teeth, the care of the eyes, the healing of wounds, the value of proper breathing, the danger of promiscuous spitting, the cause of headache and of kidney trouble; these are some of the subjects on which the board has prepared statements which are intended to be printed, each on a separate leaflet, for wide distribution among employees generally.

The conference board has also entered into a careful study of diseases peculiar to certain occupations. With their assistance and with the help of other invited experts in this field the board is proceeding cautiously and painstakingly in the study of "Occupational Diseases," and expects in due time to arrive at and publish definite conclusions.

The Conference Board of Physicians in Industrial Practice is unique in character and in method of work. It is a voluntary association of a small number of men engaged in the same field of professional work, who meet in periodic conferences of the most informal character, unfettered by any restricting rules and regulations or by any obligation to abide in their individual work by the conclusion of the board. The work of the board members, while strictly governed by professional ethics and

scientific principles, is given a most pronounced practical aspect from the fact that these physicians in industry have acquired by the nature of their work an industrial viewpoint and understanding that establishes the proper balance between what should be abstractly striven for and what can be concretely accomplished under actual working conditions.

C. B. N. A. Executive Committee Meeting

A meeting of the resident members and chairmen of the several committees of the Carriage Builders' National Association was held in Cincinnati February 10 and 11. The following were present: E. P. Ebrenz, president; Theodore Luth, chairman; W. A. Sayers, W. H. Roninger, Clem Perrine, chairman membership committee; E. M. Galbraith, chairman freight committee; P. P. Hunter, chairman committee on dealers' associations; C. J. Rennekamp, secretary Carriage Makers' Club; O. B. Bannister, Charles A. Fisher, N. B. Champ, Thompson Price and G. W. Huston.

Cincinnati being the next meeting place of the association, and as a number of prominent members are located in Cincinnati and within reasonable traveling distance, the president decided that that city would be the natural place to hold the meeting.

Secretary McLearn's report, issued January 1, was read. The list of delinquent members was carefully gone over and analyzed. Those included in the list were assigned to members present for attention and action. It was agreed that whoever had any of these delinquent members in charge should follow them up until definite results were obtained.

A series of five letters to prospective members, at intervals of ten days, was decided upon, these letters to touch upon the work which the association is doing.

Last fall the president received a letter from one of the larger supply houses, upon the face of which was printed a fac-simile of the C. B. N. A. blue badge. This letter was sent to Mr. Luth, with the suggestion that it might be well for the C. B. N. A. to have an emblem, and this matter was touched upon at this meeting, with the result that it was decided that a sticker would be appropriate, and a committee was appointed to submit designs for approval, this sticker to be pasted on the letter heads, for the purpose of indicating that the writer is a member of the Carriage Builders' National Association.

The work of the publicity committee was next taken up and discussed, and all members present urged to take advantage of the illustrated posters. The opinion was expressed that Secretary McLearn should keep in close touch with the chairmen and members of the publicity committee, and see that all members are familiarized with what is being offered, so that use will be made of these posters.

The subject of increasing the exhibitors at the Cincinnati convention next fall was taken up, and it was suggested that the president write a letter to the accessory members, urging all to make an exhibit. The purpose is to break up the habit of simply having personal representatives present, it not being fair to the exhibitors and should not be encouraged.

The names of the members of committees who will handle the convention at Cincinnati were read. Some of the plans were outlined, and all indications are that this is going to be one of the best conventions held for some

time. Much enthusiasm is being displayed by the Cincinnati people.

The following committees were appointed:

Committee on C. B. N. A. Convention and Exhibit, September 25 to 29, 1916—Theodore Luth, chairman, W. A. Sayers, E. M. Galbraith, P. P. Hunter, G. W. Huston, Clem Perrine, C. J. Rennekamp.

Local Reception and Entertainment Committee—P. P. Hunter, chairman; E. M. Galbraith, Clem Perrine, C. J. Rennekamp, C. H. Fisher.

Banquet Committee—Theodore Luth, chairman; W. A. Sayers, G. W. Huston.

Press Committee—G. W. Huston, chairman; J. Frank Hutcheson, Thomas Quinlan, Jr., C. J. Rennekamp.

Ladies' Entertainment Committee—W. A. Sayers, chairman; Mrs. W. A. Sayers, Mrs. Theodore Luth, Mrs. G. W. Huston, Mrs. E. M. Galbraith, Mrs. P. P. Hunter, Mrs. Clem Perrine, Mrs. C. J. Rennekamp.

It was the consensus of opinion of those present at the meeting that prospects are extremely favorable for an "old time" C. B. N. A. convention in Cincinnati.

Combination Gasoline and Electric Pleasure Cars

A few years ago many believed the automobile to have reached practically its ultimate form. It did not seem that it could be greatly improved or changed. The advent of the eight and twelve-cylinder engines completely disproved this theory, and a no less radical change is now taking place in connection with electric vehicles. Whether the change will be a permanent one and prove as sweeping in character in the electrical car industry as the coming of the eight and twelve has been in the gasoline car industry, is a question of speculation, and it is hardly safe at the present time to hazard a guess.

There is now an undercurrent of engineering activity leaning toward the combination gasoline-electric car with a view of obtaining the simplicity of control of the electric, together with its phenomenal acceleration qualities, its quietness, and yet have an extended range of operation beyond that of any electric, yet without the excessive battery weight of the ordinary electric or an excessively large gasoline engine.

The motoring public of America demand everything on the high gear. There seems to be an inherent dislike to gear shifting, which does not exist on the other side of the water. This has resulted in oversized, overpowered engines, which will carry a car of almost any weight, even including limousine body vehicles, practically everywhere on the high gear.

The new type of vehicle includes both the ordinary vehicle storage battery but of approximately one-half the capacity of the usual electric, and at the same time embodies in the construction a very small compact, preferably block type, gasoline engine. The two sources can be utilized independently or together for vehicle propulsion. At low speeds the car is strictly an electric, as far as the propelling power is concerned. At slightly higher speeds, the gasoline engine also comes into play but automatically, without in any way complicating the control mechanism as handled by the operator, the entire control being that of an electric. This small engine is also a source of power to supply current for the vehicle batteries, also, if desired, it supplies current directly to the electric propelling motors.

At first sight, it would seem that this would require an unusually large, weighty and cumbersome vehicle, but those who are working on the problem claim that the vehicles are not excessive in weight, have all of the advantages of the electric, combined with the speed range of the gasoline car and without excessive total weight.

This novel combination, at least for a pleasure car, bids fair to revolutionize the electric vehicle industry. Whether it will influence gasoline car design or work the electric vehicle makers out of a job is yet to be determined by the verdict of the public after the new type vehicles have been given to them.

The tendency toward electric transmissions on gasoline cars has already been noted, and whether these two tendencies will ultimately change the so-called gasoline car, as now known, is problematical. The advent and performance of the new cars will be of interest to students of the industry.—Automobile Trade Journal.

Tires Constitute Half of Rubber Trade

The production of rubber tires in the United States, during 1914, constituted almost half of the total value of all kinds of rubber goods manufactured in the country during the year. The United States Bureau of the Census, which has issued a preliminary statement of the results of the census of this branch of manufacture, gives the value of tires produced as \$146,411,692, or 48.8 per cent of the total. Next to tires, rubber foot wear was the most important product. This included boots valued at \$12,647,934 and shoes valued at \$37,858,222. Comparisons are given between the 1914 and 1909 figures for the various branches of the industry.

Reports were received from 331 establishments. The principal products of 23 of these establishments were rubber boots and shoes; of 78, rubber belting, hose, packing, etc.; and of 290, automobile tires or casings and inner tubes, motorcycle and bicycle tires, rubber clothing, druggists' and stationers' sundries, and other miscellaneous rubber goods. The products reported for the 331 establishments for 1914 were valued at \$300,251,827. At the census of 1909, 267 establishments were reported, with products valued at \$197,394,638. The increase in value of products, therefore, was \$102,857,189, or 52.1 per cent. In addition, rubber products to the value of \$446,688 were reported in 1914 by 14 establishments engaged primarily in other lines of manufacture but which produced rubber goods as subsidiary products.

Statistics of the manufacture of tires were not obtained for 1909, but it may be safely assumed that the increase of 52.1 per cent in the total annual output of rubber goods during the five-year period is accounted for in very large part of the enormous growth of this branch of the industry. There was reported the manufacture of 8,020,815 automobile tires or casings, valued at \$105,671,223; of 7,906,993 automobile inner tubes, valued at \$20,098,936; of solid tires for motor and other vehicles, to the value of \$13,735,681; and of 3,728,138 motorcycle, bicycle, and aeroplane tires, valued at \$6,905,852.

New Fifth Avenue Bus Bodies Much Improved

The new metal bodies designed and built by the Fifth Avenue Coach Co., New York City, for application to its bus chassis are being installed in place of the old ones at

the rate of one every two days. The new bodies are 800 lbs. lighter than the 24-passenger bodies formerly used, yet they seat ten more persons. They are even lighter in comparison with the 45-passenger bodies used on other of the chassis.

The new bodies are being equipped with Perfection exhaust heaters, made by the Perfection Spring Co., Cleveland, O. These heaters will use all of the exhaust and while in use will eliminate the silencer. A new type of sign is being developed which is more legible than the former type, it is more accessible for adjustment, and it is expected that both front and rear signs will be used when the latter are perfected.

Birchard L. Craig Weds Widow of Robert N. Collins

Birchard L. Craig, president of the R. N. Collins Vehicle Woodwork Co., and Mrs. Elizabeth Collins, of 3443 Hawthorne boulevard, vice-president of the company, and widow of Robert N. Collins, late president of the company, were married at the residence of Rev. Dr. R. A. Montgomery, pastor of the Tyler Place Presbyterian Church, 4001 Russell avenue, at 4:30 o'clock yesterday afternoon. Craig resides at 4145 Lindell boulevard.

Mrs. Collins is the mother of three children, Robert, Mariam and Bernice Collins, and Craig has two sons, Theron and H. E. S. Craig, the latter being treasurer and superintendent of the R. N. Collins Co. Mrs. Collins has been a widow for two years.

The wedding was a surprise to members of both families, and immediately after the ceremony the couple left for an extended honeymoon at Detroit, Mich. On their return to St. Louis they will reside at the Hawthorne boulevard address.

The company in which the Craigs and Collins were interested in is located at 3900 Chouteau avenue. The plant was destroyed by fire about three years ago, but was rebuilt.—St. Louis Globe-Democrat, February 24.

Philadelphia Vehicle Builders

The regular monthly meeting of the Carriage and Wagon Builders' Association of Philadelphia was held Friday evening, February 18, at the Hotel Hanover, 12th and Arch streets.

The question of holding a banquet in March was considered and decided in the affirmative. While the exact date has not yet been fixed, the Hotel Hanover has been selected as the place where the banquet will be held. The price will be \$1 per plate, for members, their families and friends.

A recommendation was presented setting forth the advisability of discontinuing the monthly meetings, and holding an annual meeting only, accompanied with a big banquet. This recommendation was voted down, and the meetings will be continued monthly, with the usual dinner following the business program.

Officers were nominated for the ensuing year, after which the meeting adjourned. The usual dinner was served after the business session.

Armstrong Spring Co. to Enlarge

An addition, 60 x 260 ft., is to be put up at the plant of the J. R. Armstrong Mfg. Co., Flint, Mich., automobile spring manufacturer.

High Cost of Gasoline Aids Electric Vehicles

By A. Jackson Marshall*

Most automobile owners are only too familiar with the present gasoline situation and are not particularly overjoyed at the future outlook, as the opinion seems to prevail that the price of this commodity will continue to soar. The average person, however, may not yet fully realize with what grave concern those most intimately connected with the automobile industry are likely viewing the condition of greatly increased prices, and it may be assumed that the best brains of the country are engaged in trying to solve the knotty problem of increased demand and reported insufficient supply, bringing into effect the old law of supply and demand which usually regulates prices.

There are approximately 2,500,000 automobiles in this country and it is estimated that by the end of this year there will be more than 3,000,000 cars in operation. Basing conjecture on the present estimation of automobile factory production, it seems reasonable to expect another million at the end of 1917. What the production of the succeeding years will be, only time can tell; but one thing is certain, that enormously increased demands will be made for gasoline unless some other energizing medium is adopted.

The total domestic production of gasoline, states the Horseless Age, less the quantity exported, was 35,100,000 barrels in 1915, and a simple calculation gives the number of gallons available for each car as approximately 589—perhaps enough for 9,500 miles, perhaps not. Fifteen months ago there was a reserve stock of about two million barrels of gasoline, while three months ago this had been exhausted, so that now there is no reserve to draw upon. In 1914 the Electric Vehicle Association of America understood that the production equaled 960 gallons per car in active service, with a considerable reserve. The foregoing calculations take account of gasoline only in relation to automobiles, and do not include the 300,000 motor boats at present in service and the 30,000 farm tractors operating in different agricultural districts. A glance will show that the motorist is in an even more desperate position than would seem to be the case to the casual observer, and it appears obvious that if in one year there was a reduction in the supply of gasoline of 371 gallons per car, or nearly 39 per cent, ignoring the above mentioned tractors and motor boats which are calculated to greatly increase, and the numerous stationary engines for general industrial purposes, etc., the probable further decreased supply per car for succeeding years will be much lower with its corresponding effect on the possible mileage per car, restricting the almost unlimited freedom which the gasoline car operator has heretofore enjoyed.

Nor can we probably look to any other source of supply than our own country. In fact it is reported that the oil fields of Texas, Oklahoma and Kansas must help supply foreign demand. In connection it is interesting to note what a preponderance the United States holds as an oil producer. The following are the government figures on the world's output for 1913:

	Barrels of Crude	Percentage of World's Output
United States	248,500,000	65.12
Russia	61,000,000	15.97
Mexico	25,500,000	6.74

*Secretary Electric Vehicle Association of America.

	Barrels of Crude	Percentage of World's Output
Rumania	13,500,000	3.53
Dutch East Indies.....	12,000,000	3.14
Galicia	8,000,000	2.05
Other countries	12,500,000	3.18

In 1915 we exported over 350,000,000 gallons of gasoline to Europe, which on the basis of 960 gallons per car per year would supply about 360,000 cars, or only one-third of the estimated increase for 1916. It is interesting to note that Canada, where the lowest retail price for gasoline is now 35 cents per gallon, is dependent upon the United States for her entire supply. There has recently been some talk of the possibility of an export tax imposed by the government, which, if enforced, would only temporarily relieve the situation, because the demand ever increasing, would sooner or later catch up with the supply, and we would then be face to face with the problem confronting us now.

With the prediction that 40-cent gasoline is not very far distant, both the manufacturer and operator are turning their thoughts to the ways and means of economizing on fuel. Automobile magazines are emphasizing to their readers the importance of giving more care to the general mechanism of their cars in order to avoid a waste of gasoline. Manufacturers and engineers are studying every possible means to make each part of the car perform its function with absolute efficiency, to lighten the weight of the car, and to make the cars more simple, with fewer parts, less friction, lower wind resistance, etc.

"Simplicity," states a manufacturer who sees virtue in gasoline at 40 cents, "is something that generally comes to an industry after years of development. Sometimes just such a thing as 40-cent gasoline is necessary to force the attention of all interests on simplicity."

Without doubt many valuable economic developments and refinements will be effected even in the present highly developed gas car, whose unprecedented advancement will go down in history as one of the greatest achievements of the ages, but it is a question if these improvements will offset the well nigh assured increase in the price of gasoline.

While there may be to the gasoline car manufacturer and owner some uncertainties as to the exact line of development which the future will bring, the electrical industry realizes that the use of electricity as an energizing medium for locomotion is making steady and sure progress, and is systematically consolidating gains preparatory to meeting the greatly increased demands of the future.

The well known prediction of Thomas A. Edison made in 1910, and reiterated on several occasions by the Electric Vehicle Association, that in 15 years from that time more electricity would be used for charging electric vehicles than for lighting, gives new evidence of materializing, especially when we consider that the possible available amount of gasoline or other similar fluid is an unknown quantity subject to total or partial exhaustion, while electricity, or more properly the means of producing electricity economically, are practically unlimited. While the cost of gasoline advances we will continue to find the cost of electricity decreasing, and with the inher-

ent simplicity and dependability of the electric vehicle, the fulfillment of Edison's prophesy becomes more and more of an actuality.

While there are some types of passenger cars which do not use great quantities of gasoline, and will therefore not feel the scarcity of this fuel to a great extent, there are, however, thousands of other passenger cars which get but comparatively few miles per gallon, and which will greatly feel the pinch in the amount of oil now available. For example, the gasoline taxicab in most cities is now finding it difficult to operate with any reasonable profit because of the expense per car mile, which brings it that much closer disaster. It will be found that the increased cost of gasoline will be a very serious problem to this type of car, for if the average taxicab obtains as high as 10 miles per gallon, which at the rate of 15 cents we will say, would represent $1\frac{1}{2}$ c per mile, with gasoline at 40 and 50 cents, the cost per mile for fuel alone will be from four to five cents, representing an amount generally greater than the gross profit of most gasoline taxicab concerns.

While the touring car owner, if needs be, may curtail his pleasure, the operation of gasoline commercial cars is not likely to be so easily limited; for merchandise must be transported and now that the extensive use of horse-drawn equipment is impractical, the motor vehicle is all the more extensively employed. If, for example, a five-ton commercial gasoline truck which operates under usual conditions gets about $3\frac{1}{2}$ miles per gallon of gasoline (average of the figures obtained by the Massachusetts Institute of Technology for a five-ton unit) assuming the 15 cent rate for gasoline, this would represent a cost of about four cents per mile. We will assume that the truck operates 35 miles per day, at a cost of \$1.40 for gasoline. With gasoline at 40 cents the cost per mile would be 11 cents, or a total cost of \$3.85, being an increase of \$2.45 in gasoline item alone. On a basis of 300 working days per year, the total cost of gasoline would be \$1,155. If the average initial price of a five-ton gasoline truck were \$5,000 the cost of gasoline to operate a truck of this capacity would represent 23 per cent of its initial cost. If the daily mileage were increased as is the desire of truck owners so that their investment by being more active would yield greater returns, the consumption of gasoline would be proportionately greater. If 50 miles were covered the cost of gasoline at 40 cents would be \$5.50 per day and \$1,650 per year, which emphasizes the seriousness of the situation. It should, however, be borne in mind that the cost of gasoline is a comparatively small item in the total cost of gasoline car operation.

According to the extremely comprehensive report (Bulletin No. 4) somewhat recently made by the Massachusetts Institute of Technology and already quoted by the Electric Vehicle Association, based on an extensive impartial investigation of the relative fields of horse, gasoline and electric trucks, the average cost of electricity per mile of a five-ton unit as $4\frac{1}{10}$ cents. Consequently an electric truck on this basis operating 35 miles per day would cost \$1.43 and for 50 miles per day \$2.05 for current. As the demand increases the cost of current will decrease, which will further widen the gap between the electric and gasoline-propelled vehicle. The ultimate and permanent solution of the conditions engendered by the gasoline situation is the extensive use of electricity which is rapidly superseding other forms of energy.

Big Increase in Exports of Cars

Exports of American automobiles and parts now rank fifth in value among all manufactured articles. The exports for the year 1915, valued at \$111,180,139, exceeded the combined exports of all other kinds of machinery (\$81,224,345) and the combined exports of all sorts of steam and electric railroad cars and locomotives, carriages and wagons, bicycles, tricycles, stationary and marine and automobile engines, agricultural implements and electrical machinery (\$78,015,574). They also exceeded the value of manufactured cotton and cotton clothing (\$95,827,024), manufactures of leather (\$75,268,680), chemicals, drugs, dyes and medicines (\$80,395,321) and exports of wheat flour (\$96,201,234).

The automobile exports were surpassed in value last year by exports of iron, steel and manufactures thereof (\$338,703,720), explosives (\$181,778,033), refined mineral oils (\$138,689,495), copper and manufactures (\$125,136,289), wheat (\$282,457,092), and horses, mules, cattle and sheep (\$121,641,231).

In one year the exports of motor vehicles increased more than 232 per cent—from a total value of \$28,507,464 in 1914 to \$94,879,738 in 1915. The foreign shipments of passenger cars almost doubled—from 22,335, valued at \$19,521,708, in 1914, to 41,869, valued at \$35,045,492, for the year ended December 31 last. But the exports of trucks last year increased nearly sevenfold, from 3,430, worth \$8,985,756, to 22,082, valued at \$59,834,246.

Growth of the foreign trade in American motor trucks during the last two years is even more noteworthy, for in 1913 only 1,009 commercial vehicles were exported, of a gross value of \$1,686,807, the increase in two years being 3,447 per cent.

The principal countries to which automobile exports were made last year and the volume of shipments to them were as follows:

Country	Number	Value
United Kingdom	24,355	\$35,055,097
France	6,304	15,922,313
Other parts of Europe.....	8,630	29,330,357
Canada	5,796	4,622,931
British Oceania	4,818	4,075,299
Asia and other Oceania.....	4,319	6,728,813

Bimel Automobile Co Now

The Bimel Buggy Co., Sidney, O., has reincorporated as the Bimel Automobile Co., increasing its capital to \$500,000. The buggy company was established in 1844. The present company took charge of the plant in 1905.

The company has closed out its vehicle line and will concentrate on four and six-cylinder cars. The four has been built during the last year for \$585.

The latest development is a six-cylinder model with a motor, $3\frac{1}{8}$ x 5 in., selling at \$1,000 and up. This car will be ready for delivery by April 1.

Gold Paint for Automobiles

When F. E. Runner, who recently arrived in Los Angeles from Billings, Mont., ordered a Franklin car last summer, he gave instructions that it be painted a gold color, his idea being that that was the best color to disguise the tint of Montana dust. Experience during the past few months has demonstrated the soundness of his idea, and many of his friends have since had their cars painted the same unique color.

Threatened Shortage of Vehicles

There are perhaps very few vehicle dealers in the United States who really realize the present problems that are confronting the manufacturer of vehicles.

During the past two years the vehicle manufacturers have been carrying very light stocks of raw material, and the raw material manufacturers have likewise been carrying very light stocks of material either finished or in the raw state, and the vehicle dealer as a general rule has also been carrying light stocks, so that at this time, the manufacturers without exception find themselves with little material on hand—facing on the one hand a demand for vehicles which is on a safe estimate 100 per cent greater than at this time last year, and on the other hand, facing a situation in the raw material market which is not to be heretofore found recorded in any page of business history.

In viewing a vehicle and considering the material used in its construction, one does not consider as serious the matter of iron and steel, but on a product of 15,000 jobs there is approximately 800 to 1,000 tons of steel. From November up until the present time, the advance in steel has been to the extent of about \$15 a ton, representing an increased cost in steel material on a 15,000 job production of over \$12,000.

It is true that many manufacturers have contracted for their requirements, but it must be understood that the estimated requirements of the manufacturers at contracting time were much less than the present demand requires, and that a large percentage of contracts will not be filled by the mills in time for the requirements of the manufacturer; in other words, steel tire specified for today or 30 days ago will not be shipped from the mills until the season is pretty well over with, and this condition would also hold good on springs and axles and other parts, such as bolts, screws, arm rails, bow sockets and other forgings.

Vehicle carpet, vehicle head lining and trimming is green in color, dyed green with German dyes, of which there is but a limited supply in this country—hardly sufficient at this writing to take care of even a very small percentage of the requirements on carpets, head linings and trimmings.

Green back rubber goods and green back drills are also rapidly being taken off the market, and there has been an advance since November of 15 per cent on rubber goods and like materials.

Buckrams are not only several cents higher in price, but are hard to secure, owing to the fact that nearly every shipment of burlaps from India has been sunk in transit.

Ducks for use on cushion buttons, light muslins used in trimming tops, have also continued to advance steadily. Wire used in cushion springs, tire wire and nails, of which large quantities are used in crates, advance from week to week.

Woodwork, such as piano box bodies, is advancing and is hard to secure, for the reason that there are but three or four large woodworking plants in active operation, and the carriage manufacturer has permitted his stock of bodies to run so low that he has placed orders that will not only put his stock back into proper shape again, but additional orders to take care of a largely increased business.

Last, but by far not the least—a difficulty now being experienced by the manufacturer of vehicles is the question of securing paints in the different shades, such as light and dark red and purple lakes. It has been predicted by an authority who is in a position to know whereof he

speaks, that by July (unless the situation changes) that it will be necessary for most of the vehicle manufacturers to furnish their vehicles painted black.

So much has been said with regard to leather and the shortage thereof that we do not think it necessary to even mention it.

To the outsider and perhaps a large percentage of vehicle dealers, the present situation is in a measure beyond realization, but it is a fact which cannot be denied that the leading manufacturers of vehicles in this country today are running their plants to 100 per cent greater capacity than they were running them at this time last year, and that aside from a few localities, which is expected even in a normal year, that there is promise of a demand for vehicles which will be nearly if not equal to 1910, but it is conceded by the manufacturers themselves that even though the demand should fall far short of 1910, that this quantity of vehicles could not be supplied because of the conditions existing.

The wise dealer, as a general rule, has already ordered his requirements for spring, but we would advise the dealer who has not already placed his specifications, to do so without further delay, as there is not only a possibility of his being disappointed in securing his goods when he most needs them, but he also may be confronted with a change in price, for if the conditions outlined above continue to become more strained as the season advances, the manufacturers of vehicles will be compelled to raise their selling price to correspond with the advance in the cost of materials.

Let no man think that the vehicle business is a dead business—let no man think that the automobile has entirely displaced the use of the vehicle. High-priced gasoline and a sure advance of large proportions in the selling price of automobiles, is bringing the good old buggy back into its own again at a pace that is fairly making the vehicle manufacturers dizzy.

To you who are skeptical, a visit to the leading trade centers where vehicles are manufactured will convince you that the statements made in this article are not overdrawn, but based on a very conservative view of the situation.—Contributor in Spokesman.

Queer Persian Vehicles

The two kinds of vehicles in common use in Persia differ only in appearance, the palaki being open, the kejevah covered with a light roof, generally made waterproof and with curtains before the entrance to keep out the sun, rain, wind and snow. The kejevah is the more elaborate conveyance, heavier and more expensive to hire, is used chiefly by the richer classes.

But the most comfortable means of travel and one which is used only by the wealthiest and most luxurious classes is the takhtiravan. This is a sort of palanquin consisting of a box seven feet long and five feet high, fitted with doors and windows. Inside are a soft mattress and some comfortable cushions. The whole is built on the sedan chair principle, but with mules instead of men as bearers. The poles rest on the pack saddle on the backs of the mules, which walk tandem. They can, of course, only be used in the long plains and are useless when the route goes over hilly country. The motion reminds one of a rolling ship, and some people even get giddy and seasick at first in them.

Such personages as princes, governors and high officials

always travel with many followers and hangers-on. It is a most picturesque sight to meet such a caravan, from which the pipe bearer is never missing. In front of his saddle are found large round cases covered with bright red cloth, containing the silver water bottles and the silver tops of the kalia (water pipe). Under the horse on one side is a perforated metal fire box hanging on a chain and containing the burning charcoal, while on the other side swings a heavy leather bottle full of water in readiness to prepare to pipe on the road. A clever bearer prepares the apparatus as he rides along, gallops up to his master and hands him his ready prepared smoking pipe to enjoy a few pulls.

The luncheon or tea horse is another necessity for the journey. Anywhere on the high road it can be unloaded, and within a few minutes the felt carpet, carried on the saddle behind the rider, is spread on the ground, the samovar, cups, sugar and lemons arranged on a tray on one corner, and, kneeling beside these, the servant hands out the tea to the travelers. When ready to remount they leave him behind, and he packs up and follows at a smart canter, soon rejoining the caravan.—Travel.

Shale to Yield Future Gasoline Supply

It is estimated by the United States Geological Survey that in Colorado alone there is sufficient shale, in beds three feet or more thick, to yield 20,000,000,000 barrels of crude oil from which at least 2,000,000,000 barrels of gasoline may be extracted by ordinary refining processes.

Little attention has been paid to this shale because the quantity of petroleum produced from wells in the United States has been sufficient to satisfy all demands, but for more than 50 years the oil shale industry of Scotland has been a very important one. In a recent year more than 8,000 men were employed in the industry in that country, yet the average yield of oil per ton of shale was much less than that which appears possible from the shale of Colorado and Utah.

The area that has been studied by the Geological Survey comprises northwestern Colorado, northeastern Utah, and southwestern Wyoming. The shale found there contains materials which, when heated, may be converted into crude oil, gas and ammonia. Sooner or later this great source of supply will be utilized to supplement the decreasing production from the regular oil fields.

When refined by ordinary methods the shale oil yields an average of about 10 per cent gasoline, 35 per cent kerosene, and a large amount of paraffin.

Belgian Trade Leaders Indicted

Van den Plass, the world-famed Belgian body builders, Captain Masui, for many years a leading automobile agent in London, and two other Belgian subjects, are now before the military court at Calais on a charge of defrauding the Belgian government. It is declared that the sum involved is \$10,000,000 to \$12,000,000, the case being so serious that the Belgian government is acting as civil prosecutor. Soon after war broke out, the men involved were sent to England to make purchases of automobiles for the Belgian army. A little later they obtained other purchasing commissions for all kinds of material required by the Belgian army. It is declared that they have obtained enormous fraudulent profits on these transactions, and on an inquiry being opened a few days ago it was discovered that they

had made cash deposits in a London bank totalling \$340,000.

Before the war Van den Plass was at the head of an automobile body factory at Brussels, where he employed 4,000 work people. He was generally recognized as one of the most artistic and best body builders in the world.

Reid-Conant Concern, Boston, Now W. D. Bryon & Sons

The name of the Reid-Conant Leather Co., Boston, has been changed to the W. D. Bryon & Sons Leather Co., and the capital stock has been increased to \$150,000. The officers of the new company are H. V. Conant, president; Louis T. Byron, Orville Beachley and Willis L. Altenderfer, vice-president; N. W. Prouty, treasurer; J. D. Moore, clerk. This company will, as heretofore, handle the product of W. D. Byron & Sons, Inc., Williamsport, Md., and Mercersburg, Pa., and W. D. Byron & Sons Mfg. Co., Hanover, Pa. The principal products of this firm are automobile and furniture leather; bag, case and strap leather; patent sides, flexible innersoling, waxed and flexible splits. The automobile and furniture leather formerly sold from the tannery will in the future be sold through Boston. Messrs. Conant, Prouty and Moore have been connected with the Reid-Conant Leather Co., Boston, and will continue to take care of the New England business. The shoe trade in Pennsylvania will be handled by Willis L. Altenderfer, and Mr. Beachley will have charge of the automobile trade.

Carriage Business Shows Good Figures

The annual statement of Carriage Factories, Limited, Montreal, shows that after paying charges, bond interest and \$122,500 for depreciation, the balance added to profit and loss was \$225,202, against \$24,741 a year ago.

After adding interest and rent charges to subsidiary companies amounting to \$13,560, the gross for the period was \$309,263, compared with \$129,643 last year, increase of \$199,620. The net profits for the year were \$297,230, against \$117,783 in 1914.

Only two quarterly dividends, at the rate of 7 per cent, were paid, and the balance carried forward to profit and loss was \$225,202, which with balance of \$127,188 carried forward from last year brought the total balance up to \$352,391, as compared with \$127,188 a year ago. The balance sheet shows current assets amounting to \$1,877,796, goods on hand amounting to \$935,155.

Announces Large Truck Production

The Studebaker Corporation announces that it will produce 10,000 commercial cars this year.

Three models of the half-ton carrying capacity are announced, and the same number of the one-ton capacity. The half-ton models include the panel delivery car, \$875; open express car, \$850; station and baggage wagon, \$875. One-ton trucks include the open express type, \$1,200; stake body type, \$1,250; 16-passenger omnibus type, \$1,400.

Although the Studebaker Corporation has been building commercial cars of half-ton capacity for several years, it has never attempted production on so large a scale as is arranged for 1916.

The new models will be equipped with electric starter, electric lights, speedometer and other features.

Measurements and Calculations

Mental habit is one of the hardest things in the world to alter—especially if it is in the other fellow. We grow to let the mind work automatically as in addition and multiplication, and a change involves concentration and effort which are not only a burden, but involve liability to error. And so in measurement and computation we struggle with a complication of systems, rather than make the big effort needed for a real solution of the problem.

Man learned to count and compute on his fingers, and still learns that way. Hence, his computing is by 10s or the decimal system, and 10 digits are universally used in this work. But in measuring the natural division is by halves, thirds and quarters; division into tenths and fifths is bothersome and inaccurate, hence 12, which is divisible by 2, 3 and 4 is the natural number of divisions for measurement.

To get complete reconciliation of the systems of measurement and computation now used by English-speaking peoples, says Practical Engineer, will involve radical departure from some present standard. The metric system, devised by scientists largely interested in computation, brought the system of measurement into harmony with the natural method of computing, but at a loss in convenience of measurement, for only 2 and 5 are available as even divisions of the unit, and one-fifth is not a natural or convenient division for ordinary work, however well it may apply in scientific measuring instruments.

The opposite method of compromise, i. e., using 12 digits, has been proposed and many details worked out. It presents no insurmountable difficulties except in-grained human experience and custom, and the fact that our fingers still remain 10, and these are the first helps to counting and calculating that the child uses. The monetary systems of most countries are also decimal, so that the disturbance to commerce would be unthinkable if a duo-decimal or 12-digit system of reckoning were attempted.

Length of the yard was originally derived from the human reach, and then standardized as a metal bar in London. Length of a meter was meant to be a division of a quadrant of the earth's surface, but the attempt failed, and it is now a metal bar in Paris. So that the meter and yard are both purely arbitrary lengths, and the same applies to the pound and kilogram. It would seem that a logical thing would be to establish a new unit of length that will harmonize both systems and permit of subdivision and calculation in its own decimal units, and easy conversion to either system. This might well be established as the American system, and adopted by the Pan-American Union as an allowable standard, the names of units being chosen by a scientific committee named by that Union.

For the standard of length of such a system 5 ft. or 60 in. seems to offer many advantages. It is equal to 1.524 meters; to 152.4 centimeters. This conversion factor is divisible by 2, 3 and 4, and the length in inches, 60 is divisible in 2, 3, 4, 5 and 10. Consider a few of the relations of the New Unit, or nu. for short:

$$\frac{1}{2} \text{ nu.} = 30 \text{ in.} = 2.5 \text{ ft.} = 76.2 \text{ c.m.} = 0.762 \text{ m.}$$

$$\frac{1}{3} \text{ nu.} = 20 \text{ in.} = 1 \frac{2}{3} \text{ ft.} = 50.8 \text{ c.m.} = 0.508 \text{ m.}$$

$$\frac{1}{4} \text{ nu.} = 15 \text{ in.} = 1 \frac{1}{3} \text{ ft.} = 38.1 \text{ c.m.} = 0.381 \text{ m.}$$

While the multipliers for conversion to metric measurements look irregular, they are exact in three places; and are immeasurably simpler than conversion from yard or feet or inches to metric units.

Going to larger measurements, the mile is 1,056 nu. If a greater unit or gu. be taken, as 1,000 nu., or 5,000 ft., it will equal 1,524 meters or 1.524 km., so that the same conversion multipliers will hold between the gu. and the kilometer as between the nu. and the meter.

For areas the square new unit equals 2.322 square meters or 25 sq. ft., and for volumes the cubic new unit equals 3.54 cubic meters or 125 cu. ft. And to correspond to the gallon, a cube of 0.1 the new unit on a side or 6 in. might be used, giving a volume of 216 cu. in. or $\frac{1}{8}$ cu. ft. or 3,540 cu. centimeters.

If we wish to divide the new unit decimally, 0.1 nu. = 6 in., 0.5 ft., or 15.24 c.m.; 0.01 nu. = 0.6 in., 0.05 ft., or 1.524 c.m. and 0.001 nu. = 0.06 in. or 1.524 m.m., all of which maintain the same relative simple relations as the new unit, the foot, the inch and the meter.

If the United States of America is to enter world markets, our measurements must conform to those of the countries with which we trade, and a simple relation of units, or adoption of the metric units for foreign trade must come.

In one measurement with which engineers have frequently to deal, there seems no logical course but to change over entirely, namely the measurement of temperatures. All thermometers are graduated on the decimal scale, and there is no possible defense of the Fahrenheit scale except that it exists. The Centigrade scale has science, good sense and large use in its favor, and the sooner the cumbersome Fahrenheit scale disappears the better. We shall need new steam and other tables, but that is comparatively easy, and the use of freezing as 0 deg. and boiling as 100 deg. has everything in its favor. That miserable 32 which appears in nearly every steam computation is a nuisance. If the weather department will only urge and Congress will sanction the use of the Centigrade scale in all weather reports, the change would be completed in a few months' time and we should forget the old scale much to the benefit of everybody.

Jamaica May Turn to Use of Electric Vehicles

"Because of the excellent roads and the popularity of automobiles here," writes Consul J. C. Monaghan, Kingston, under date of February 17, "the prevailing high cost of gasoline makes the present an excellent time to introduce electric vehicles in Jamaica. This applies to both pleasure cars and trucks. Gasoline is sold at about 48 cents United States currency per gallon. Water power in Jamaica is plentiful, but undeveloped. Electricity for charging is available, but not on a commercial basis. In considering a market for motor vehicles here the steep grades must be kept in mind, although the average grade varies from 1.2 to 1.6."

A list of firms in Kingston which might be interested in the sale of electric vehicles may be obtained from the Bureau of Foreign and Domestic Commerce or its district offices. Refer to file No. 73.487.

St. Louis Drafting Class

The closing exercises and exhibition of the St. Louis class in carriage and automobile body drafting were held at the Central High School the evening of March 10. The class was promoted by the St. Louis Carriage, Wagon and Body Builders' Club and invitations to the club members to attend the exercises were sent out by Louis Moller, Jr., president, and A. E. Spaete, secretary for the club.

Injunction in Perlman Patent Case

An injunction in the Perlman demountable rim suit was served March 8 on the Standard Welding Co., of Cleveland, O., who make over 70 per cent of the demountable rims used, for over 60 of the biggest producing automobile makers use their rims on their output.

The Standard Welding Co. have already contracted to deliver over 400,000 sets of demountable rims for that number of automobiles for use during 1916. Practically every large producer of automobiles is affected by this injunction, such as Packard, Overland, White, Maxwell, Studebaker, Reo, Dodge, Chalmers, Hudson and many others.

Undoubtedly great pressure will be brought by these great automobile makers on the rim producers to take out licenses under the Perlman patent, and to come to terms with Perlman, who, Barkis like, is willin,' but the rim makers so far have been obdurate.

Mr. Perlman expressed great regret for the need for this injunction, but says it was absolutely necessary in order to bring the royalty question to a settlement and focus, and protect his patent from further infringement.

This Perlman rim case now assumes national importance because of the entry of the National Automobile Chamber of Commerce into the matter. Frederick P. Fish, of Boston, now appearing not only in behalf of the Standard Welding Co., but also on behalf of the National Automobile Chamber of Commerce in the recent royalty negotiations and litigation.

The history of the case is as follows: Perlman's elementary and foundation rim patent was granted in February, 1913. Later on in the same year he sued the Standard Welding Co., of Cleveland, O., for infringement. Judge Hunt, in the United States District Court for the Southern District of New York handed down a decision last August declaring Perlman's patent valid and infringed by the Standard Welding Co. and directed an accounting and ordered an injunction to issue. The Standard Welding Co. appealed to the United States Circuit Court of Appeals for the Second Circuit and the case was tried in January of this year, and the decision of the lower court was affirmed on February 15, being one of the last acts of Judge Lacombe, who has just retired. Meanwhile, the attorneys for the Standard Welding Co. secured a stay and asked for a re-hearing by the Circuit Court of Appeals, and a modification of the injunction and mandate. Both petitions were denied and declared frivolous by the Court of Appeals after a hearing. And so after all the fruitless efforts to agree upon a basis of royalty the injunction was finally served by a U. S. Marshal on the representatives of the Standard Welding Co. in New York City and in Cleveland.

Mr. Perlman's suit against the Packard Motor Car Co. in New Jersey District of the Federal Court, is meanwhile held in abeyance, and it may be possible that other suits will be brought against makers branch houses, and dealers among New York's automobile row, if the rim makers and automobile makers do not come to terms with Mr. Perlman.

Perlman Rim Corporation Organized

Announcement was made March 15 of the formation of the Perlman Rim Corporation, under the laws of the state of New York, with a capital of \$10,000,000. The company

has acquired all of the patents, applications for patents and rights of L. H. Perlman, the inventor of the Perlman demountable rim, which, in various forms, is now in almost general use throughout the world.

While the company has a broad charter, it will, for the time being at least, confine its operations to the manufacture and sale of demountable rims of which upwards of 700,000 sets will be required to meet the demands for the season of 1916.

Mr. Perlman, the president of the company, makes the following statement:

"The threatened shutdown of automobile production incident to the settlement of the demountable rim patents controversy has now been happily averted. The manufacture of automobiles, so far as demountable rims are concerned, will go on as usual and without pause. Infringing rim makers and users will be treated fairly."

The Perlman Rim Corporation is being financed by L. G. Kaufman, president of the Chatham & Phenix National Bank, who has associated with him a number of prominent and equally influential interests.

Trustee of Pontiac Buggy Co. Winds Up Affairs

S. E. Beach, as trustee of the Pontiac (Mich.) Buggy Co., has filed a petition in circuit court requesting that the court wind up the affairs of the company and dissolve the corporation. The company was incorporated in 1893 for the manufacture and sale of wagons, buggies and other vehicles and was formerly located in a portion of the buildings now occupied by the Oakland Motor Car Co. The manufacture of vehicles was concluded in September, 1909, and the machinery sold and removed. Since that time Mr. Beach has been engaged in collecting accounts and settling outstanding obligations.

The trustee states that the accounts are now collected and the obligations paid, with the exception of a small fee for his attorneys and the cost of dissolving the company. The moneys collected have been apportioned from time to time among the stockholders until there remains a balance of but \$944.79.

Judge Smith has fixed May 12 as the day for the hearing of the petition before Circuit Court Commissioner E. E. Blakeslee.

American Motors Corporation Organized

The American Motors Corporation, of Newark, N. J., has just been formed with a capital of \$1,250,000 to manufacture a moderate-priced car from designs thought to represent advanced ideas. A group of eastern business men are interested.

Louis Chevrolet, of Detroit, has been selected vice-president and chief engineer. Those interested include William Howard Hoople, president of the Interstate Electric Corporation, of Newark; John C. Spiers, formerly general manager of the Auto Car Co., and factory manager of the Locomobile, Mercer, S. G. V., and Standard Roller Bearings companies, and George F. Baright, formerly advertising manager of the Prudential Life Insurance Co., of Newark.

The Sun Varnish Co., Louisville, Ky., an old established institution of that city, makes the announcement that in the future its line will also embrace vehicle varnishes.

Trade News From Near and Far

Business Changes

C. A. Patton, vehicle and hardware dealer at Ironton, O., has been succeeded by Ummel & Funk.

Miss Lulu Baldwin has purchased the vehicle and implement stock of J. W. Long, at Bowling Green, O.

Yake & Hardy have succeeded to the vehicle and implement business of Russell Yake, at Deckerville, Mich.

Louis Hufford's implement and vehicle store at Tiffin, O., has been purchased by John Park and Albert Gurney.

Krueger & Grahn have succeeded to the implement and vehicle business of Krueger & Lamprecht, Princeton, Wis.

McClure & Simms have succeeded to the implement and vehicle business of McClure & Mays, at Springfield, Ky.

S. J. Hamilton has purchased the implement and vehicle department of the Cantwell hardware store at Kenton, O.

The Farmers' Exchange, at Mutual, O., dealing in implements and vehicles, has been taken over by I. W. Holmes.

Geo. W. Helmick will close out his stock of implements and buggies at Farmer City, Ill., and devote his entire attention to the automobile line.

Myers & Cooley have succeeded to the implement and vehicle business formerly conducted by the Valley Implement & Vehicle Co., at El Paso, Tex.

At Flemingsburg, Ky., a deal has been closed whereby S. T. Collins & Co. have succeeded the Collins-Morton Co. in the vehicle and harness business.

T. S. Wood, of State Center, Ia., has sold out his implement and vehicle business there to Hilleman & Nichols, but continues his automobile business there.

Sorgen Bros. & Co., implement and vehicle dealers at Markle, Ind., have purchased an implement store at Kenton, O., and will continue to operate both stores.

The firm of Cripe & Robinson, at Delphi, Ind., has been dissolved. E. M. Cripe has purchased the interest of his partner in the buggy, implement and harness business and will continue the same at the old stand.

A. C. Newcomer, dealer at Newburg, Ia., has bought out the farm machinery and vehicle business of W. E. House at Gilman, a neighboring town, and announces that he will continue to conduct both stores.

N. T. Nelson has sold his implement and vehicle store at Stanhope to his father, Ivor E. Nelson, proprietor of the Stanhope Hardware Co. of Stanhope. The latter will combine the two stores and continue both lines.

John A. Crary, senior member of the well known vehicle firm of Crary & Bangham, at Wilmington, O., retires after 26 years of business on account of ill health, turning his interest over to his son, Harry S. Crary, so that the firm name remains the same.

Charles Weidner has sold his stock of vehicles, implements and hardware at Mooresville, Ind., to William

Wilson. Mr. Weidner will devote his time to his automobile business in Indianapolis, where he has charge of the state sales for the Alter automobile.

The firm of Betzer Bros., Lodi, O., has been dissolved and the vehicle and implement business will in the future be conducted by C. M. Fetzer. He will also handle the automobile business. The other departments of the business will be conducted by N. H. Fetzer.

Henry Larson has retired from the implement and vehicle business at Sinai, S. D., and in the future the business will be conducted by the Larson Implement Co., with Robert Larson as manager. Henry Larson is 72 years of age and believes he has earned a rest.

New Firms and Incorporations

The firm of Courtney & Wilson is a new implement and vehicle concern at Perry, Ia.

L. A. Pugh has engaged in business at Butler, Ind., with a line of implements, vehicles, hardware, etc.

New Twentieth Century Storm Buggy Co., Fort Recovery, O.; \$10,000; Sebastian Ranley, H. W. Long, J. E. Heffern, C. H. Steinele, C. W. Bryan.

Shortsville Wheel Co. (reorganization), Shortsville, N. Y., spokes, rims, mill supplies; \$25,000; M. M. Brown, G. E. Godfrey, E. T. Sheffer, Shortsville.

The Central Wagon and Auto Co. has been incorporated at Cleveland, O.; capital \$75,000; incorporators, H. D. Squires, G. E. Bradbury, C. E. Mellon, H. A. Beckett, L. C. Spieth.

The Independent Implement Co. has been incorporated at Eau Claire, Wis., with a capital of \$5,000, for the purpose of handling farm implements and vehicles. The incorporators are John Gilbert, Wm. Craig and Arthur Gilbert.

General Vehicle Trade News

The Old Line Carriage Works, Springfield, Mo., is putting up a new structure, 80 x 150 feet.

The Meteor Motor Car Co., Piqua, O., will soon fit up part of its plant for the manufacture of automobile bodies.

The Koenig Wagon Co., of Kansas City, Mo., filed a statement showing increase of its capital stock from \$6,000 to \$24,000.

The M. I. McAvoy Co., Racine, Wis., has been organized with \$25,000 capital to manufacture automobile tops, frames, etc.

The Maxwell Motor Co., Detroit, Mich., has purchased a site at Windsor, Ont., and will commence work shortly on a factory to cost \$45,000.

The Ford Motor Co. will build an assembling plant at Calgary, Alberta, to cost \$200,000. The initial building will be 130 x 200 ft., four stories.

The Timken Roller Bearing Co., Canton, O., has placed its new seamless tube steel plant in operation, which is now running at full capacity on a 24-hour schedule.

OBITUARY

John Balzer, Sr., 88, pioneer carriage and wagon maker of Sheboygan, Wis., died February 21 of heart failure. Mr. Balzer was born in Germany and came to this country in 1851, locating in Sheboygan. After working at wagon making there for a year he opened his own shop. In 1881 he took his son, John Balzer, Jr., into partnership and in 1888 retired, the son continuing. Three children survive him.

James H. Hassett, 59, since young manhood and up until a few years ago, actively identified with the Amesbury, Mass., carriage industry, first as a mechanic and in later years as a manufacturer, died at his residence in February. He was one of the founders of the well known manufacturing firm of Hassett & Hodge who built up one of the most successful carriage businesses in Amesbury. He was a director of the old Amesbury National Bank and when it consolidated with the Powow River National Bank became a member of the directorate of that institution and held the position up to the time of his death. For the past few years Mr. Hassett has lived a retired life. His health began to fail him a year ago and he has been gradually failing since. His death was not unexpected. In addition to the wife, a daughter, Miss Charlotte Hassett, survives.

John H. Lueth, 83, carriage builder of Kankakee, Ill., died at his home in that city on February 2. Mr. Lueth was born in Germany in 1833, and came to this country when 21 years old. He located in Chicago, where he was employed at his trade as wagon builder with Peter Schuttler. He went to Kankakee in 1857, where he started in vehicle making and as a dealer in implements. The business which he started is now owned and operated by his sons under the firm name of Lueth Bros. Mr. Lueth is survived by his widow and two sons.

Edward Rowland, president William & Harvey Rowland Co., manufacturer of vehicle springs, Frankford, Philadelphia, died at his home in Chestnut Hill, March 1, from heart disease, aged 71 years. He was born in Philadelphia.

John H. Ryan, 71, for many years a member of the firm of Miller & Ryan, carriage manufacturers of St. Johnsbury, Vt., died February 3 of Bright's disease. Mr. Ryan was born in Moreton and went to St. Johnsbury in 1867, where he entered the employ of the Miller Carriage Co. He afterwards became a member of the firm and at Mr. Miller's death he bought the Miller interests and managed the factory alone until two years ago, when he sold it on account of ill health. He is survived by one daughter and seven sisters.

John Andrew Schott, 82, formerly senior partner in the firm of Schott & Immell, wagon manufacturers at Columbus, O., passed away at his daughter's home in Columbus on February 22. He is survived by two sons, three daughters, nine grandchildren and four great grandchildren.

George Schubert, for many years identified with the former Schubert Brothers Gear Co., of Oneida, N. Y., died February 25 at Palestine, Tex. His death was caused by pneumonia, and his illness lasted only about a week. After the final dissolution of the Schubert Brothers Gear Co., Mr. Schubert went to Texas for his health, living there with his brother. He is survived by his widow and four children.

To Make Better Citizens of Its Men

The Goodyear Tire & Rubber Co., Akron, O., in order to extend to its employes of foreign birth opportunities of making themselves better citizens, is organizing classes in the English language and American citizenship. Announcements of the coming classes have been posted in the plant printed in the various languages spoken. These classes will start at once, at hours convenient for every man. The Goodyear plant work 24 hours a day, necessitating three shifts, but both day and night classes will be arranged, so that all who desire may take advantage of them. In the English classes instruction will be adapted to the needs of the men. In the citizenship classes American history will be taught, together with the fundamental principles of our government, the geography of our country, and other subjects necessary to make intelligent citizens and voters of the men.

WANTS

Help and situation wanted advertisements, 1 cent a word; all other advertisements in this department, 5 cents a word; initials and figures count as words. Minimum price, 30 cents for each advertisement.

PATENTS

Patents—H. W. T. Jenner, patent attorney and mechanical expert, 606 F St., Washington, D. C. Established 1883. I make a free examination and report if a patent can be had and exactly what it will cost. Send for circular.

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WHAT IT IS

The American Harness and Saddlery Directory

The 1915 Edition

An extra painstaking revision of the names (and other information as below) constituting the Retail Harness Trade, has been completed for this year's issue of the Directory, and we think the work is so important and worthy that the

1915 Price Is \$5 Per Copy

and it is very moderate for what is offered in a work that is

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for copying of addresses, and for all purposes usual in a directory.

Just a Sketch of Its Contents

The list of the **WHOLESALE** and **JOBGING TRADE** is so arranged as to make it convenient to separate the association members from those not so recognized.

The **RETAIL HARNESS MAKERS** of the United States and Canada comprise the principal part of the Directory, arranged by State, Town and County, and in the large cities, the street and number is given. Those rating (approximately) over \$1,000 are marked.

A list of **HARNESS DEALERS** as distinguished from retail harness manufacturers, is also given. The value of this list to those who solicit the vehicle, implement, hardware and department stores will be readily appreciated.

A list is also published of Export Commission Merchants, giving the class of merchandise they handle.

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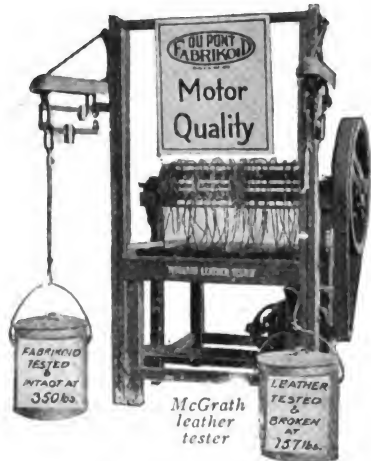
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